Rocky Flats Environmental Technology Site

TYPE 1

PRE-DEMOLTION SURVEY REPORT (PDSR)

Buildings 664 and T664A Closure Project

REVISION 0

October 20, 2004

CLASSIFICATION REVIEW NOT REQUIRED PER
EXEMPTION NUMBER CEX-005-02

1/23

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REVISION 0

October 20, 2004

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TABLE OF CONTENTS

ABBREVIATIONS/ACRONYMS ..... **IV**

EXECUTIVE SUMMARY ..... **V**

1 INTRODUCTION **1**

1.1 PURPOSE 1
1.2 SCOPE 1
1.3 DATA QUALITY OBJECTIVES 1

2 HISTORICAL SITE ASSESSMENT **2**

3 RADIOLOGICAL CHARACTERIZATION AND HAZARDS **2**

4 CHEMICAL CHARACTERIZATION AND HAZARDS **3**

4.1 ASBESTOS 4
4.2 BERYLLIUM (BE) 4
4.3 RCRA/CERCLA CONSTITUENTS [INCLUDING METALS AND VOLATILE ORGANIC COMPOUNDS (VOCS)] 4
4.4 POLYCHLORINATED BIPHENYLS (PCBS) 5

5 PHYSICAL HAZARDS **5**

6 DATA QUALITY ASSESSMENT **5**

7 DECOMMISSIONING WASTE TYPES AND VOLUME ESTIMATES **6**

8 FACILITY CLASSIFICATION AND CONCLUSIONS **6**

9 REFERENCES **7**

ATTACHMENTS

A Facility Location Map
B Historical Site Assessment Reports
C Radiological Data Summaries and Survey Maps
D Chemical Data Summaries and Sample Maps
E Data Quality Assessment (DQA) Detail

ABBREVIATIONS/ACRONYMS

ACM	Asbestos containing material
Be	Beryllium
CDPHE	Colorado Department of Public Health and the Environment
CERCLA	Comprehensive Emergency Response, Compensation and Liability Act
$DCGL_{EMC}$	Derived Concentration Guideline Level – elevated measurement comparison
$DCGL_W$	Derived Concentration Guideline Level – Wilcoxon Rank Sum Test
D&D	Decontamination and Decommissioning
DDCP	Decontamination and Decommissioning Characterization Protocol
DOE	U.S. Department of Energy
DPP	Decommissioning Program Plan
DQA	Data quality assessment
DQOs	Data quality objectives
EPA	U.S. Environmental Protection Agency
FDPM	Facility Disposition Program Manual
HVAC	Heating, ventilation, air conditioning
HSAR	Historical Site Assessment Report
IHSS	Individual Hazardous Substance Site
IWCP	Integrated Work Control Package
K-H	Kaiser-Hill
LBP	Lead-based paint
LLW	Low-level waste
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MDA	Minimum detectable activity
MDC	Minimum detectable concentration
NORM	Naturally occurring radioactive material
NRA	Non-Rad-Added Verification
OSHA	Occupational Safety and Health Administration
PARCC	Precision, accuracy, representativeness, comparability and completeness
PCBs	Polychlorinated Biphenyls
PDS	Pre-demolition survey
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RFFO	Rocky Flats Field Office
RLC	Reconnaissance Level Characterization
RLCR	Reconnaissance Level Characterization Report
RSP	Radiological Safety Practices
SVOCs	Semi-volatile organic compounds
TCLP	Toxicity Characteristic Leaching Procedure
TSA	Total surface activity
VOCs	Volatile organic compounds

EXECUTIVE SUMMARY

A Reconnaissance Level Characterization (RLC) was performed to enable facility "Typing" per the DPP (10/8/98) and compliant disposition and waste management of Buildings 664 and T664A. Because these facilities were anticipated Type 1 facilities, the characterization was performed in accordance with the Pre-Demolition Survey Plan (MAN-127-PDSP) requirements. All facility surfaces were characterized in this RLC, including the interior and exterior surfaces (i.e., floors, walls, ceilings and roof). Environmental media beneath and surrounding the facilities were not within the scope of this RLCR and will be addressed at a future date using the Soil Disturbance Permit process and in compliance with RFCA.

The RLC encompassed both radiological and chemical characterization to enable compliant disposition and waste management pursuant to the D&D Characterization Protocol (MAN-077-DDCP). The characterization built upon physical, chemical and radiological hazards identified in the facility-specific Historical Site Assessment Report.

Results indicate that no radiological contamination exists in excess of the PDSP unrestricted release limits of DOE Order 5400.5. All beryllium sample results were less than 0.1 $\mu g/100cm^2$ and all asbestos results were "None Detected". All demolition debris will be managed in compliance with regulations governing PCBs (40 CFR 761), and Environmental Compliance Guidance #27, *Lead-Based Paint (LBP) and Lead-Based Paint Debris Disposal,* as applicable. A Closure Description Document has been submitted to CDPHE for Building 664 RCRA Permitted Container Storage Unit 20 that proposes to close Unit 20 administratively prior to demolition. Additionally, the secondary containment pans in Building 664 will be closed under the "Clean Debris" rule prior to demolition, or transferred to another permitted unit at RFETS and used until the receiving unit is ready for closure.

Based upon the data presented in this RLCR, Buildings 664 and T664A are considered Type 1 Facilities. To ensure the facilities remain free of contamination and RLC data remain valid, Level 2 Isolation Controls have been established and the facilities posted accordingly.

1 INTRODUCTION

A Reconnaissance Level Characterization (RLC) was performed to enable facility "Typing" per the DPP (10/8/98) and compliant disposition and waste management of Buildings 664 and T664A. Because these facilities were anticipated Type 1 facilities, the characterization was performed in accordance with the Pre-Demolition Survey Plan (MAN-127-PDSP) requirements. All facility surfaces were characterized in this RLC, including the interior and exterior surfaces (i.e., floors, walls, ceilings and roof). Environmental media beneath and surrounding the facilities were not within the scope of this RLCR and will be addressed at a future date using the Soil Disturbance Permit process and in compliance with RFCA.

As part of the Rocky Flats Environmental Technology Site (RFETS) Closure Project, numerous facilities will be removed, among these are Buildings 664 and T664A. The location of these facilities is shown in Attachment A, *Facility Location Map*. These facilities no longer supports the RFETS mission and will be removed to reduce Site infrastructure, risks and/or operating costs.

Before these facilities can be removed, a Reconnaissance Level Characterization (RLC) must be conducted; this document presents the RLC results. The PDS was conducted pursuant to the Decontamination and Decommissioning Characterization Protocol (MAN-077-DDCP) and the Pre-Demolition Survey Plan for D&D Facilities (MAN-127-PDSP). The PDS built upon physical, chemical and radiological hazards identified in the facility-specific Historical Site Assessment Report (HSAR).

1.1 Purpose

The purpose of this report is to communicate and document the results of the PDS effort. A RLC is performed before Type 1 building demolition to define the pre-demolition radiological and chemical conditions of a facility. Pre-demolition conditions are compared with the unrestricted release limits for radiological and non-radiological contaminants. RLC results will enable project personnel to make final disposition decisions, develop related worker health and safety controls, and estimate waste volumes by waste types.

1.2 Scope

This report presents the pre-demolition radiological and chemical conditions for Buildings 664 and T664A. Environmental media beneath and surrounding this facility were not within the scope of this PDSR and will be addressed using the Soil Disturbance Permit process and in compliance with RFCA.

1.3 Data Quality Objectives

The Data Quality Objectives (DQOs) used in designing this PDS were the same DQOs identified in the Pre-Demolition survey Plan for D&D Facilities (MAN-127-PDSP.) Refer to section 2.0 of MAN-127-PDSP for these DQOs.

2 HISTORICAL SITE ASSESSMENT

A Facility-specific Historical Site Assessment (HSA) was conducted to understand the facility histories and related hazards. The assessment consisted of facility walk-downs, interviews, and document review, including review of the Historical Release Report (refer to the D&D Characterization Protocol, MAN-077-DDCP). Results were used to identify data gaps and needs, and to develop radiological and chemical characterization plans. Results of the facility-specific HSAs were documented in a facility-specific *Historical Site Assessment Report (HSAR) for the Area 5-Group 9 Facilities,* dated November 2002, Revision 0 (Building 664) and *Historical Site Assessment Report (HSAR) for the Area 5-Group 7 Facilities,* dated October 2002, Revision 0 (Building T664A). Refer to Attachment B, *Historical Site Assessment Reports* for a copy of the respective HSAs. In summary, the HSARs identified the low potential for radiological and chemical hazards.

3 RADIOLOGICAL CHARACTERIZATION AND HAZARDS

Buildings 664 and T664A were characterized for radiological hazards per the PDSP. Radiological characterization was performed to define the nature and extent of radioactive materials that may be present on the facility surfaces. Measurements were performed to evaluate the contaminants of concern. Based upon a review of historical and process knowledge, building walk-downs, and MARSSIM guidance, a Radiological Characterization Plan was developed during the planning phase that describe the minimum survey requirements (refer to the RISS Characterization Project files).

Radiological survey packages 664501 (Building 664) and 664A06 (Building T664A were developed for the interior surfaces of Buildings 664 and T664A. The exterior surfaces of Buildings 664 and T664A were surveyed as part of radiological survey package EXT-B-001. The survey packages were developed in accordance with Radiological Safety Practices (RSP) 16.01, *Radiological Survey/Sampling Package Design, Preparation, Control, Implementation and Closure*. Total surface activity (TSA), removable surface activity (RSA), and scan measurements were collected in accordance with RSP 16.02 *Radiological Surveys of Surfaces and Structures*. Radiological survey data were verified, validated and evaluated in accordance with RSP 16.04, *Radiological Survey/Sample Data Analysis*. Quality control measures were implemented relative to the survey process in accordance with RSP 16.05, *Radiological Survey/Sample Quality Control.*

Ninety (90) TSA measurements (29 systematic, 29 biased, 30 equipment and 2 QC) and eighty-eight (88) RSA measurements (29 systematic, 29 biased and 30 equipment) were performed on the interior facility surfaces, and 25% of the facility interior floor and a minimum of 5% of the remaining interior surfaces were scanned in Building 664. Floors scans were performed at biased locations where suspect activities were performed. Twenty-seven (27) TSA measurements (15 systematic, 10 biased and 2 QC) and twenty-five (25) RSA measurements (15 systematic and 10 biased) were performed on the interior facility surfaces, and 5% of the facility interior surfaces were scanned in Building T664A. The RLC data confirmed that the building does not contain plutonium or uranium contamination above the surface contamination guidelines provided in the PDSP.

7

Radiological survey data, statistical analysis results, and survey locations are presented in Attachment C, *Radiological Data Summary and Survey Maps*. The radiological survey unit packages are maintained in the RISS Characterization Project files.

The exterior radiological surveys for Buildings 664 and T664A were performed as part of the RISS West Side Exterior PDS strategy effort (authorized by Department of Energy letter, *02-DOE-01598*, dated December 13th, 2002 and approved by CDPHE letter, *RE: Proposed Deviations From The Pre-Demolition Survey Plan (PDSP)*, dated January 27, 2003; refer to the RISS Characterization Project Files for letter copies). The RISS West Side exterior building radiological surveys and locations can be found in survey unit package EXT-B-001, *RISS West Side Building Exteriors*. Seven (7) biased TSA measurements, seven (7) biased RSA measurements, and a one (1) square meter scan at each of the seven TSA/RSA locations were performed at biased locations on the exterior surfaces of Building 664. Three (3) biased TSA measurements, Three (3) biased RSA measurements, and a one (1) square meter scan at each of the three TSA/RSA locations were performed at biased locations on the exterior surfaces of Building T664A. The RLC data collected in exterior survey unit package EXT-B-001 confirmed that the exterior surfaces of Buildings 664 and T664A do not contain radiological contamination above the surface contamination guidelines provided in the PDSP. Radiological survey data, statistical analysis results, and survey map locations for the West-Side Exterior survey unit package EXT-B-001 are maintained in the RISS Characterization Project files.

4 CHEMICAL CHARACTERIZATION AND HAZARDS

Buildings 664 and T664A were characterized for chemical hazards per the PDSP. Chemical characterization was performed to determine the nature and extent of chemical contamination that may be present on, or in these facilities. Based upon a review of historical and process knowledge, visual inspections, and PDSP DQOs, additional sampling needs were determined. A Chemical Characterization Plan (refer to RISS Characterization Project files) was developed during the planning phase that describes sampling requirements, the justification for the sample locations and estimated number of samples. Contaminants of concern included asbestos, beryllium, RCRA/CERCLA constituents, lead and PCBs. Refer to Attachment D, *Chemical Data Summaries and Sample Maps*, for details on sample results and sample locations.

8

4.1 Asbestos

A survey of building materials suspected of containing asbestos was conducted in Buildings 664 and T664A in accordance with the RLCP criteria. A CDPHE-certified asbestos inspector conducted the inspection and survey in accordance with the *Asbestos Characterization Protocol,* PRO-563-ACPR, Revision 1. All laboratory results of building materials suspected of containing asbestos were "None Detected." However, the remaining composite roofing material (roof flashing and tar) is assumed to be Category 1 non-friable asbestos and will be removed during demolition activities and disposed of as sanitary waste. Refer to Attachment D, *Chemical Data Summaries and Sample Maps*, for details on sample results and sample locations.

4.2 Beryllium (Be)

Based on the HSAR and personnel interviews, Buildings 664 and T664A were anticipated Type 1 facilities. There was not, however, adequate historical and process knowledge to conclude that beryllium was not used or stored in these buildings. Therefore, biased beryllium sampling was performed in accordance with the PDSP and the *Beryllium Characterization Procedure, PRO-536-BCPR, Revision 0, September 9, 1999.* Biased sample locations corresponded with the most probable areas of dust accumulation (including beryllium dust), assuming airborne deposition.

All beryllium smear sample results were less than 0.1 $\mu g/100cm^2$. Beryllium laboratory sample data and location maps are contained in Attachment D, *Chemical Data Summaries and Sample Maps.*

4.3 RCRA/CERCLA Constituents [including metals and volatile organic compounds (VOCs)]

Based on the HSAR, facility walk-downs and a review of RFETS waste management databases, Building 664 functioned as RCRA Permitted Container Storage Unit 20. A Closure Description Document has been submitted to CDPHE that proposes to close Unit 20 administratively prior to demolition. Additionally, the secondary containment pans in Building 664 will be closed under the "Clean Debris" rule prior to demolition, or transferred to another permitted unit at RFETS and used until the receiving unit is ready for closure. In anticipation of RCRA closure activities in Building 664, and based on historical knowledge of activities in Building T664A, RCRA/CERCLA sampling was not performed as part of this PDS.

Sampling for lead in paint in these facilities was not performed. Environmental Waste Compliance Guidance #27, *Lead-based Paint (LBP) and Lead-based paint Debris Disposal,* states that LBP debris generated outside of currently identified high contamination areas shall be managed as non-hazardous (solid) wastes, and additional analysis for characteristics of hazardous waste derived from LBP is not a requirement for disposal.

These facilities contained common regulated building materials such as mercury switches, batteries, and fluorescent lamps. However, a thorough inspection of the facility will be made prior to demolition to verify that these regulated materials have been removed.

9

4.4 Polychlorinated Biphenyls (PCBs)

Based on a review of the HSAR and facility walk-downs, there is no history of PCB use or evidence of PCB contamination in these facilities. Buildings 664 and T664A were never used to store PCB waste. Based on the age of the Building 664 (constructed before 1980), paints used are assumed to contain PCBs, and painted surfaces will be managed as PCB Bulk Product Waste. Because Building T664A was constructed after 1980, PCBs are not a concern in the paint.

These facilities may have contained fluorescent light ballasts containing PCBs. Prior to demolition, all ballasts will be inspected and all leaking PCB ballasts, and those weighing more than 9 pounds will be removed and managed appropriately.

5 PHYSICAL HAZARDS

Physical hazards associated with Buildings 664 and T664A are those common to standard industrial environments and include hazards associated with energized systems, utilities, and trips and falls. There are no unique physical hazards associated with these buildings. However, care should be taken during demolition activities as Building 664 is near the following IHSSs, PACs, or UBCs: 400-157.2 "Radioactive site South Area-Active", 400-807 "Sandblasting Area-Active", 600-121.2 "Fiberglass Area West of Building 664-Active" and 600-161 "Radioactive Site-Building 664", Active. Physical hazards are controlled by the Site Occupational Safety and Industrial Hygiene Program, which is based on OSHA regulations, DOE orders, and standard industry practice.

6 DATA QUALITY ASSESSMENT

Data used in making management decisions for decommissioning of Buildings 664 and T664A and consequent waste management are of adequate quality to support the decisions documented in this report. The data presented in this report (Attachments C and D) were verified and validated relative to DOE quality requirements, applicable EPA guidance, and original DQOs of the project.

In summary, the Verification and Validation (V&V) process corroborates that the following elements of the characterization process are adequate:

- ◊ the *number* of samples and surveys;
- ◊ the *types* of samples and surveys;
- ◊ the sampling/survey process as implemented "in the field"; and,
- ◊ the laboratory analytical process, relative to accuracy and precision considerations.

Details of the DQA are provided in Attachment E.

7 DECOMMISSIONING WASTE TYPES AND VOLUME ESTIMATES

The demolition and disposal of Buildings 664 and T664A will generate sanitary waste and PCB Bulk Product Waste. Estimated waste types and waste volumes are presented below. All waste can be disposed of as sanitary waste, except PCB Bulk Product Waste. The remaining composite roofing material (Category 1 non-friable asbestos roof flashing and tar) will be managed and disposed of as sanitary waste during demolition activities. There is no hazardous waste. PCB ballasts will be managed pursuant to the Site PCB waste management procedures.

Waste Volume Estimates and Material Types

Facility	Concrete (cu ft)	Wood (cu ft)	Metal (cu ft)	Corrugated Sheet Metal (cu ft)	Wall Board (cu ft)	ACM (cu ft)	Other Waste (cu ft)
Building 664	19,000	0	7,500	3,000	2,500	0	None
Building T664A	0	1,100	800	1,000	1,500	0	None

8 FACILITY CLASSIFICATION AND CONCLUSIONS

Based on the analysis of radiological, chemical and physical hazards, Buildings 664 and T664A are classified as RFCA Type 1 Facilities pursuant to the RFETS Decommissioning Program Plan (DPP; K-H, 1999) and can be demolished. The Type 1 classification is based on a review of historical and process knowledge, and newly acquired RLC data.

The PDS of Buildings 664 and T664A was performed in accordance with the DDCP and PDSP. All PDSP DQOs were met, and all data satisfied the PDSP DQA criteria. The facility does not contain hazardous wastes. PCB ballasts will be managed and disposed of in compliance with Environmental Protection Agency (EPA) and Colorado Department of Public Health and Environment (CDPHE) regulations. Demolition debris will be managed in compliance with regulations governing PCBs (40 CFR 761), and Environmental Compliance Guidance #27, *Lead-Based Paint (LBP) and Lead-Based Paint Debris Disposal,* as applicable. A Closure Description Document has been submitted to CDPHE for Building 664 RCRA Permitted Container Storage Unit 20 that proposes to close Unit 20 administratively prior to demolition. Additionally, the secondary containment pans in Building 664 will be closed under the "Clean Debris" rule prior to demolition, or transferred to another permitted unit at RFETS and used until the receiving unit is ready for closure.

Environmental media beneath and surrounding the facilities will be addressed at a future date using the Soil Disturbance Permit process and in compliance with RFCA. To ensure these Type 1 facilities remain free of contamination and RLC data remain valid, Level 2 Isolation Controls have been established and the facilities posted accordingly.

9 REFERENCES

DOE/RFFO, CDPHE, EPA, 1996. Rocky Flats Clean-up Agreement (RFCA), July 19, 1996.

DOE Order 5400.5, "Radiation Protection of the Public and the Environment."

EPA, 1994. "The Data Quality Objective Process," EPA QA/G-4.

K-H, 1999. Decommissioning Program Plan, June 21, 1999.

MAN-131-QAPM, *Kaiser-Hill Team Quality Assurance Program*, Rev. 1, November 1, 2001.

MAN-076-FDPM, *Facility Disposition Program Manual*, Rev. 3, January 1, 2002.

MAN-077-DDCP, *Decontamination and Decommissioning Characterization Protocol*, Rev. 3, July 15, 2002.

MAN-127-PDSP, *Pre-Demolition Survey Plan for D&D Facilities*, Rev. 1, July 15, 2002.

MARSSIM - Multi-Agency Radiation Survey and Site Investigation Manual, December 1997 (NUREG-1575, EPA 402-R-97-016).

PRO-475-RSP-16.01, *Radiological Survey/Sampling Package Design, Preparation, Control, Implementation, and Closure*, Rev. 1, May 22, 2001.

PRO-476-RSP-16.02, *Pre-Demolition (Final Status) Radiological Surveys of Surfaces and Structures*, Rev. 1, May 22, 2001.

PRO-477-RSP-16.03, *Radiological Samples of Building Media*, Rev. 1, May 22, 2001.

PRO-478-RSP-16.04, *Radiological Survey/Sample Data Analysis for Final Status Survey*, Rev. 1, May 22, 2001.

PRO-479-RSP-16.05, *Radiological Survey/Sample Quality Control for Final Status Survey*, Rev. 1, May 22, 2001.

PRO-563-ACPR, Asbestos Characterization Procedure, Revision 0, August 24, 1999.

PRO-536-BCPR, Beryllium Characterization Procedure, Revision 0, August 24, 1999.

RFETS, Environmental Waste Compliance Guidance #25, Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition.

RFETS, Environmental Waste Compliance Guidance #27, Lead-Based Paint (LBP) and Lead-Based Paint Debris Disposal.

RFCA Standard Operation Protocol for Recycling Concrete, September 28, 1999.

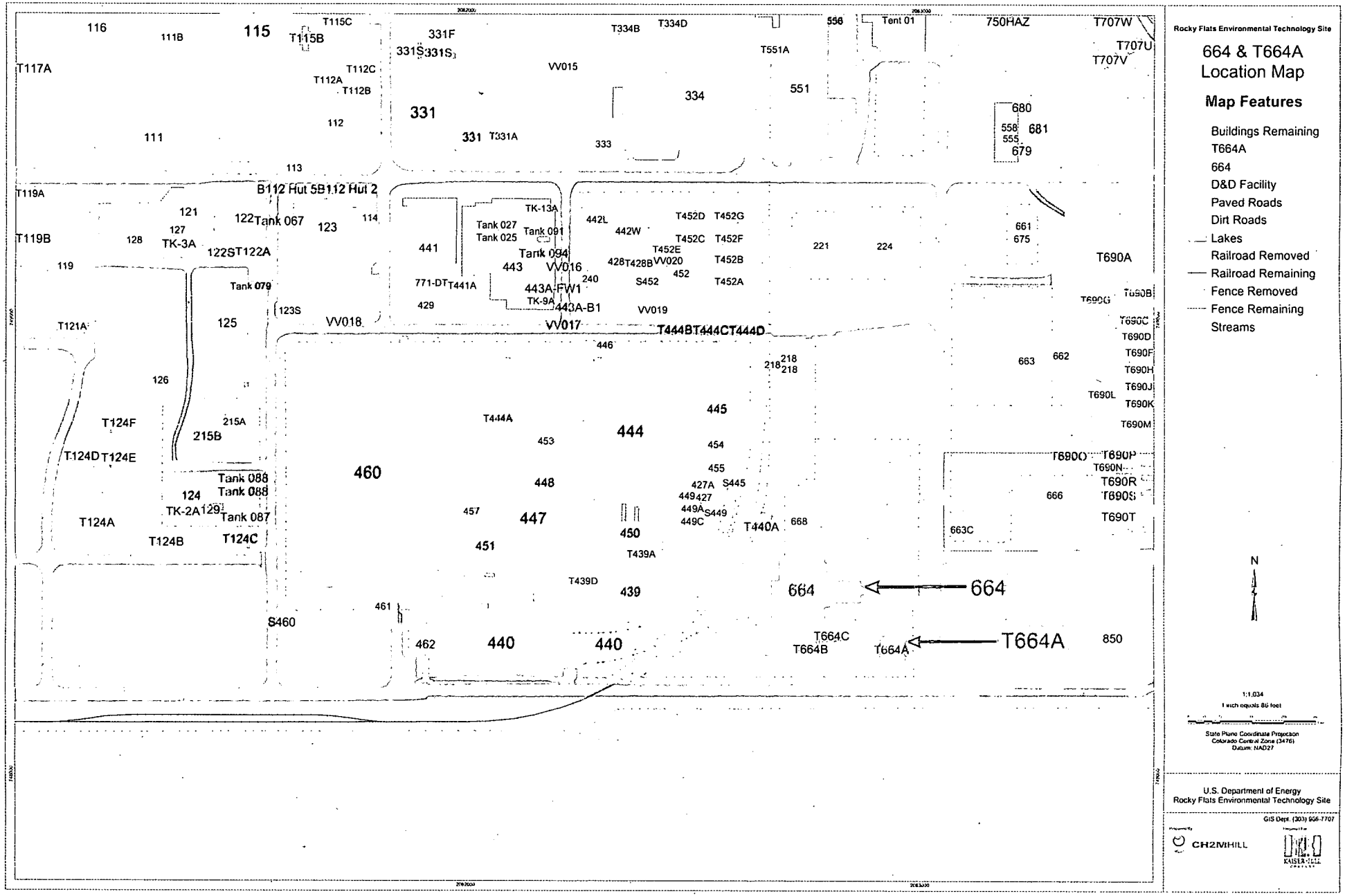
Historical Site Assessment Report (HSAR) for the Area 5 - Group 9 Facilities, Dated November, 2002, Revision 0.

Historical Site Assessment Report (HSAR) for the Area 5 - Group 7 Facilities, Dated October, 2002, Revision 0.

12

ATTACHMENT A

Facility Location Map



Rocky Flats Environmental Technology Site

664 & T664A Location Map

Map Features

- Buildings Remaining
- T664A
- 664
- D&D Facility
- Paved Roads
- Dirt Roads
- Lakes
- Railroad Removed
- Railroad Remaining
- Fence Removed
- Fence Remaining
- Streams

1:1,034
1 inch equals 86 feet

State Plane Coordinate Projection
Colorado Central Zone (3476)
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

GIS Dept. (303) 966-7707

CH2MHILL

W:\Projects\Y2004\04-0839\664 location map.mxd

ATTACHMENT B

Historical Site Assessment Reports

Facility ID: (AREA 5 - GROUP 9) Buildings 440, 664, T664B, and T664C.
Anticipated Facility Type (1, 2, or 3): Buildings 440, T664B, and T664C are anticipated Type 2 facilities. Building 664 is an anticipated Type 1 facility.

This facility-specific Historical Site Assessment (HSA) has been performed in accordance with:
D&D Characterization Protocol, RFETS MAN-077-DDCP, latest version, and
Facility Disposition Program Manual, RFETS MAN-076-FDPM, latest version

Physical Description

Building 440

Building 440 is an approximately 59,000 square foot structure built in 1971. The structure is a pre-fabricated building built on a concrete foundation. The exterior walls are constructed of insulated metal panels attached to a steel frame. The roof is constructed of metal decking with built-up roofing.

Building 440 has the following utilities: electrical, plant water, plant sanitary, plant steam, and fire protection is provided by an overhead sprinkler system and wall mounted fire extinguishers.

Building 664

Building 664 is an approximately 18,700 square foot building constructed in 1972. The structure is a pre-fabricated metal building built on a concrete foundation. The exterior walls are constructed of insulated metal panels attached to a steel frame. The roof is constructed of metal decking with built-up roofing.

Building 664 has the following utilities: electrical, plant water, plant sanitary, plant steam, and fire protection is provided by an overhead sprinkler system and wall mounted fire extinguishers.

Trailer T664B

Trailer T664B is a 320 square foot modified semi-trailer acquired in 2001. T664B is used to house real-time radiographic equipment for counting waste crates. This trailer has a metal roof, metal sides and a wood floor covered with metal sheeting. This unit is considered a portable unit and is easily relocated.

Trailer T664B has the following utilities: electrical and fire protection is provided by wall mounted fire extinguishers.

Trailer T664C

Trailer T664C is a 280 square foot modified semi-trailer acquired in 2001. T664C is used to house real-time radiographic equipment for counting waste drums. This trailer has a metal roof, metal sides and a wood floor covered with metal sheeting. This unit is considered a portable unit and is easily relocated.

Trailer T664C has the following utilities: electrical and fire protection is provided by wall mounted fire extinguishers.

16

Historical Operations

Building 440

Building 440 was originally constructed as a production control, shipping of products for final assembly and shipping wastes for disposal. Special nuclear materials and depleted uranium were staged and shipped out of this building by truck and railcar. In the early 1970s, Building 440 was also used to modify and repair railroad cars, semi-truck trailers, and escort vehicles to meet specific DOE requirements for transport of special nuclear materials and radioactive wastes. Vehicle modification work in Building 440 continued until 1994. Most of the original equipment associated with this activity has been shipped to other DOE plants. Production processes in Building 440 included various welding, painting, machining, pipe fitting, metal working, and electrical work used to modify transports. Modification efforts focused on developing entry deterrents. Paint booths were used to coat fabricated, non-nuclear components and the transports. The gantry and 5-ton cranes were used to move materials associated with the transport modification effort.

Building 440 was expanded three times to include a railcar bay, a high bay, paint booths, locker rooms in support of transport modification efforts and a 20,000 Square Foot Storage Area. Room 114 was a railcar bay. The railroad tracks, which were covered with poured concrete in the early 1990 is approximately 5 feet lower than the main building floor. Gantry cranes present in Rooms 105 and 114 were used to move equipment and materials used in the modification of safe secure transports. Industrial-sized paint booths were located in Rooms 113 and 123.

Currently Building 440 is used as a permitted, LLW, TRU, mixed waste storage, shipping, WIPP characterization, and waste repackaging facility. Building 440 installed 2 permacons and a glovebox with associated HEPA filtration systems, in the late 1999s and early 2000s, used to characterize and repackage non-conforming waste packages. There is no known building contamination (outside of the 2 permacons, glove box and associated ventilation systems). See the Building 440 WSRIC for a more detailed explanation of these activities.

Building 664

Building 664 is a waste storage, waste staging, and waste shipping facility and is a permitted LLW, mixed, and TRU wastes storage facility. All radioactive wastes received in Building 664 have already been packaged for final disposal in either 55-gallon metal drums or in metal or wooden crates. The contents of these packages are examined by an RTR unit to determine if the waste meets internal packaging requirements and off-site waste acceptance criteria. The packaged wastes is then labeled and marked before being shipped to their final destination. The building once housed fiberglass operations during the late 1980s and early 1990s, to seal LLW waste containers prior to shipping. The fiberglass operation was located on the west side of the facility and has been removed.

Trailer T664B

Trailer T664B is a modified semi-trailer used to house real-time radiographic equipment. These trailers are used to so radiological surveys on waste containers to determine compliance with waste packaging requirements. This trailer was purchased in 2001 and is considered a portable unit.

Trailer T664C

Trailer T664C is a modified semi-trailer used to house real-time radiographic equipment. These trailers are used to so radiological surveys on waste containers to determine compliance with waste packaging requirements. This trailer was purchased in 2001 and is considered a portable unit.

17

Current Operational Status

Buildings 440, 664, T664B, and T664C are all operational.

Contaminants of Concern

Asbestos

Describe any potential, likely, or known sources of Asbestos:

Building 664 and 440 are posted as potentially containing asbestos. Trailers T664B and T664C have no asbestos posting. The Industrial Hygiene Group (IH) has collected some asbestos data on the Building 440. Contact IH for a copy of this information.

Beryllium (Be)

Describe any potential, likely, or known Be production or storage locations:

None of the facilities addressed in this HSA are on the List of known Be Areas.

Summarize any recent Be sampling results:

There have been no recent Be samples collected on any of these facilities.

Lead

Describe any potential, likely, or known sources of Lead (e.g., paint, shielding, etc.):

Based on the age of some of the facilities addressed in this HSA, lead in paint may be a concern. No processes containing lead were conducted in these facilities.

RCRA/CERCLA Constituents

Describe any potential, likely, or known sources of RCRA/CERCLA constituents (e.g., chemical storage, waste storage, and processes):

Building 440 and 664 are permitted LLW, TRU, and mixed waste storage areas. See the Historical operations section above for a detailed listing of the operations which occurred in the facilities addressed in this HSA. Building 440 has RCRA Unit 440-1, which covers Container Storage, Repackaging, and Staging. This RCRA unit will be closed in accordance with the " The RCRA Part B Permit No. CO-97-05-30-01, Part X (6/30/97). Building 664 has RCRA Unit 20, which covers Container Storage in rooms 100, 110, and the High Bay Area. This RCRA unit will be closed in accordance with the " The RCRA Part B Permit No. CO-97-05-30-01, Part X (6/30/97).

Describe any potential, likely, or known spill locations (and sources, if any):

None of the facilities in this HSA have had any RCRA/CERCLA spills.

Describe methods in which spills were mitigated, if any:

None of the facilities in this HSA have had any RCRA/CERCLA spills.

18

PCBs

Describe any potential, likely, or known sources of PCBs (e.g., light ballasts, paints, equipment, etc.):

No PCB containing process where housed in any of the facilities addressed in this HSA. Based on the age of construction of some of these facilities, PCBs in paint may be a concern.

Describe any potential, likely, or known spill locations (and sources, if any):

No PCB spills occurred in any of the Facilities addressed in this HSA.

Describe methods in which spills were mitigated, if any:

No PCB spills occurred in any of the Facilities addressed in this HSA.

19

Radiological Contaminants

Describe any potential, likely, or known radiological production or storage locations:

Building 440 is a permitted LWW and TRU waste storage facility. Building 440 is also used for WIPP characterization and waste repackaging of non-conforming waste packages. Waste repackaging is performed in 2 permacons and a glove box. Any contamination associated from this activity is confined to the 2 permacons, glove box and associated HEPA ventilation system. The UBC section of the HRR states that uranium, on limited occasions, may have machined or modified in Building 440. No further evidence of this was found. Building 664 is a permitted waste staging, storage and shipping facility. Trailers T664B and T664C are used to perform real-time radiological surveys of waste containers.

See the Historical Operations section above for a more detailed listing of the operations which occurred in the facilities addressed in this HSA.

Describe any potential, likely, or known spill locations (e.g., known leaking sealed radioactive sources, leaking waste drums, potentially contaminated drains, etc.):

An interviewee recalled that in the early day of operation of Building 440, the south dock area got contaminated with uranium during container movement operations. The contamination was cleaned up to the standards of the day using instrumentation of the day. Building 664 was a waste staging, storage and shipping facility, historically, the waste container sometime had residual contamination on there exterior. Because of this, occasional elevated reading were detected. These areas were cleaned to the standards of the day using instrumentation of the day.

Describe methods in which spills were mitigated, f any:

The contamination was cleaned up to the standards of the day using instrumentation of the day.

Describe any potential, likely, or known isotopes of concern (e.g., weapons grade plutonium, uranium isotopes, pure beta emitters, mixed fission products, etc.):

Isotopes of concern include uranium and plutonium.

Describe any potential, likely, or known external facility contamination (e.g., stack release points, unfiltered ventilation, facility's physical location to known site releases, etc.):

See section below for information on IHSSs PACs, and UBCs.

20

Environmental Restoration Concerns

Describe any ER concerns that could affect facility characterization (e.g., IHSSs, PACs, UBCs):

Building 440 is associated with or located near the following IHSSs, PACs, or UBCs. See individual IHSS, PAC, or UBC report for additional information.

1) 400-806, "Catalyst Spill, Building 440", NFA approved 1992.
2) 400-157.2, "Radioactive site South Area", Active.

Building 440 is a UBC due to past machining and modification activities.

Building 664 is associated with or located near the following IHSSs, PACs, or UBCs. See individual IHSS, PAC, or UBC report for additional information.

1) 400 - 157.2, "Radioactive site South Area", Active.
2) 400 - 807,"Sandblasting Area", Active.
3) 600 -121.2,"Fiberglassing area west of Building 664", Active.
4) 600 - 161,"Radioactive Site - Building 664", Active.

Trailers T664B and T664C are not associated with any IHSSs, PACs, or UBCs.

Additional Information

Describe any additional information that may be useful during facility characterization (e.g., contaminant migration routes, waste handling operations, physical hazards, Historical Release Reports, WSRIC data, etc.):

None

References

Provide all sources of information utilized to gather data for facility history (e.g., documents, files, interviews):

Sources reviewed to complete this HSA were the RFETS Facility List, the Historical Release Report, Site Master List of RCRA Units, and the Site IHSS, PAC, and UBC databases. The WSRIC for those buildings with a WSRIC. In addition, a facility walkdown and interviews were performed.

Waste Volume Estimates and Material Types

Facility	Concrete (cu ft)	Wood (cu ft)	Metal (cu ft)	Corrugated Sheet Metal (cu ft)	Wall Board (cu ft)	ACM (cu ft)	Other Waste (cu ft)
Building 440	50,000	0	18000	6000	800	TBD	N/A
Building 664	19000	0	7500	3000	2500	TBD	N/A
Trailer T664B	0	125	600	0	0	TBD	N/A
Trailer T664C	0	100	400	0	0	TBD	N/A

Further Actions

Recommend any further actions, if any (e.g., characterization, decontamination, special handling, etc.):

Begin the RLC/PDS process.

21

Note:
This HSA was performed prior to SME walkdowns, and chemical and radiological characterization package preparations. SMEs should evaluate and/or verify all information during the RLC/PDS process. SMEs may need to review additional documentation and perform additional interviews. Information contained in this HSA only represents a "snapshot" in time. Subsequent data may be obtained during SME walkdowns and chemical and radiological characterization package preparations, which may conflict with this report. However, this report will not be amended, and the newer data will take precedence over the data in this report. Newer Data will appear in the RLCR/PDSR.

Prepared By:	Doug Bryant	/s/	November 2002
	Name	Signature	Date

22

Facility ID: (AREA 5 - Group 7) Buildings 460, 439, 462, 668, and T664A.
Anticipated Facility Type (1, 2, or 3): Buildings 460, 439, 668, 462 and T664A are anticipated Type 1 facilities.

This facility-specific Historical Site Assessment (HSA) has been performed in accordance with:
D&D Characterization Protocol, RFETS MAN-077-DDCP, latest version, and
Facility Disposition Program Manual, RFETS MAN-076-FDPM, latest version

Physical Description

Building 460

Building 460 is a 212,980 square foot, two-story structure, built in 1984. The structure is a pre-fabricated building constructed on a concrete foundation. The exterior walls are constructed of insulated metal panels attached to a steel frame. The roof is constructed of metal decking with built-up roofing. Building 460 is configured with the south half of the building as office space and a high-bay area on the north half of the building. The ceilings of the office area are 2-foot by 4-foot acoustical panels with recessed light fixtures. The floors in the offices are mostly carpeted. The ceiling in the high-bay area is the underside of the roof and the floor is concrete.

Building 460 has the following utilities: electrical, plant water, plant sanitary, plant steam, and fire protection is provided by an overhead sprinkler system and wall mounted fire extinguishers. Building 460 was originally connected to the site process waste system. The building's process waste system was isolated in the mid 1990s.

Building 439

Building 439 is a 5,140 square foot, single story building constructed in 1971. This structure is a pre-fabricated insulated metal building constructed on a concrete slab. This building is configured with a high bay area in the center of the building and several smaller machine rooms and offices on the east and west sides of the building.

Building 439 has the following utilities: electrical, plant water, plant sanitary, and fire protection is provided by an overhead sprinkler system and wall mounted fire extinguishers.

Building 462

Building 462 is a 590 square foot cooling tower constructed in 1985 and provides cooling water to Building 460. Building 462 is a metal structure elevated above a concrete pad by 8 concrete pedestals.

Building 462 has the following utilities: electrical and plant water.

23

Building 668

Building 668 is a 1,540 square foot single-story building constructed in 1957. The exterior walls are Transite® panels and fiberglass panels, the floor is a concrete pad pour on grade. Building 668 is not a heated building and does not have a ventilation system. The building was once wire for electricity but is currently disconnected. The building was also fitted with fire protection sprinkler heads, but these heads were never activated.

Building 668 currently has no utility hook-ups.

Trailer T664A

Trailer T664A is a 4,392 square foot general office trailer acquired in 1991. This trailer has corrugated metal siding with corrugated metal skirting. The entrances have wooden stairs leading to a wooded enclosure. The interiors are primarily a cubical layout, but have several hard-walled offices, conference rooms, and rest rooms. Interior walls are wallboard, the ceiling is a drop ceiling with acoustical tiles and recessed lights. The floors are primarily covered with carpet except in the bathrooms, which are covered with vinyl tile.

Trailer T664A has the following utilities: electrical, plant water, plant sanitary, and fire protection is provided by an overhead sprinkler system and wall mounted fire extinguishers.

Historical Operations

Building 460

Building 460 was originally constructed as a manufacturing facility designed to fabricate stainless steel and other non-nuclear parts such as reservoirs, tubes, and non-fissile trigger components. Building 460 housed fabrication operations such as Mechanical Machining in Room 134, Electrochemical machining and Grinding in Room 141, Electro Discharge machining is room 141, and Crush grinding in room 142. Assembly machining in room 143, welding in rooms 122A, 122C, 132, 132B, 132C and 135, Grit Blasting in room 135B, Cleaning in rooms 156, 156C, and 157. Inspection operation in rooms 115A, 115H, 121, 122B, 123, 151A, 151S, and 163. A metallurgical laboratory was operated in Room 135. Room 141B housed a Hexavalant Chrome reduction process which was not part of the RCRA permit due to its classification as a recycling operation and this equipment still remain. Building 460 also had a cafeteria on the second floor until the mid 1990s

Process wastes were collected in 4 sump tanks. Sump Tank ST1 was located in room 141B, ST2 was located in Room 151, ST3 was located in Room 156,and T4 was locat4ed in room 156C. All these tanks have been closed in accordance with the "RCRA Closure Plan for the B460". The facility's process wastewater collection and filtration system was located in Room 140 and consisted of 2 holding tanks and a sump tank. Wastewater was filtered prior to being transported to Building 374 for treatment. These tanks have also been closed in accordance with the "RCRA Closure Plan for the B460". Most of the process waste lines were overhead lines and only in a few areas were they located in the concrete floor slab. Much of the process waste lines and process waste equipment were removed during the closure process. Waste streams handled in Building 460 included solvents, metals, and acids. See the building 460 WSRIC for a more complete list of process that occurred in Building 460.

In the mid 1990 manufacturing operation ended in Building 460 and most of the process equipment was removed. The building was then used as an administrative office building housing primarily DOE personnel. Building 460 begin storing low level radioactive, RCRA and TSCA wastes in September 2002. Building 460 is currently a containerized waste storage facility, and does not perform any waste repackaging or waste treatment.

Building 439

Building 439 was originally a fabrication and machine shop, which supported Building 440 operations as well as other R&D operations. Historically, this building housed such operations as an organic coating lab in the southeast corner of the building. A machine shop located on the west side of the building, quality assurance testing equipment such as NDT, ultrasonic density testing and tinsel testing equipment on the north side of the facility. Other operation housed in Building 439 include electronic equipment services, Gamma Survey instrument maintenance, silver recovery related to electronic equipment, Radiological counting and survey operations, and PU&D equipment release operations. Currently Building 439 is currently used to store equipment, as a break room, and general offices in support of Building 440 operations.

Building 462

Building 462 is the evaporative cooling tower for Building 460. The cooling system consists of both an open loop and closed loop system interconnected by a heat exchanger. Nalco 2536 is added to the cooling water to prevent rust build-up and Nalco 2590 is added to the cooling water for alga control. Sodium Hypochlorite is used as a fungicide and biocide.

Building 668

Building 668 is the Drum Certification Building. Building 668 was originally used to seal fiberglass-coated wood waste crates after being filled with low level waste. The crates were sealed using fiberglass matting and sprayed on fiberglass resin. This operation was moved to Building 664 in the 1980's and the building was then used to inspect, number, label, and certify new waste crates and waste drums prior to being sent to the production buildings to be filled with waste. Although the waste crates sealing operations that occurred in the early days of operation did contain radioactive waste, the waste containers where never opened, they were only permanently sealed prior to shipment. There is no evidence of any radiological contamination related to this event. Polyester resins and cleaning solvents where used in the fiberglass operations.

Trailer T664A

Trailer T664 is a general office trailer, which has historically, be used to house management and administrative personnel in support of waste storage and shipping operation conducted in Buildings 440 and 664.

Current Operational Status

Buildings 460, 439, 462 and Trailer T664A are all operational. Building 668 is not operational, but has some old equipment and supplies related to past operation, which need to be cleaned out.

Contaminants of Concern

Asbestos

Describe any potential, likely, or known sources of Asbestos:

Building 668 is posted as containing asbestos, T664A is posted as possibly containing asbestos.
The Industrial Hygiene Group (IH) has collected some asbestos data on Building 460. Contact IH for a copy of this information.

Beryllium (Be)

Describe any potential, likely, or known Be production or storage locations:

The only facility on the List of Historic and Present Be Areas is the High Bay area of Building 460. The High Bay area is list based on historical information that beryllium copper plates where occasionally polished in the high bay area. The UBC section of the HRR states that Be may have occasionally been handled in Building 439. No evidence of this was found.

Summarize any recent Be sampling results:

There have been no recent Be samples collected on any of these facilities.

Lead

Describe any potential, likely, or known sources of Lead (e.g., paint, shielding, etc.):

Based on the age of some of the facilities addressed in this HSA, lead in paint may be a concern. No processes containing lead were conducted in these facilities.

RCRA/CERCLA Constituents

Describe any potential, likely, or known sources of RCRA/CERCLA constituents (e.g., chemical storage, waste storage, and processes):

Building 460 was a major non-nuclear manufacturing facility and used chemicals such as acids, bases and solvents. Metals contamination of these chemicals did occur as part of the machining and fabrication operations (i.e. chromium). Building 460 had several permitted RCRA units associated with these activities. These RCRA units have been closed. Building 460 is currently a permitted LLW and mixed waste Storage facility. Historically, Building 439 was used as a machine shop to support Building 440 operations and other maintenance operations in the 400 area. No significant amounts of RCRA or CERCLA Constituents were handled in this facility. See the Historical operations section above for a more detailed listing of the operations which occurred in the facilities addressed in this HSA.

Building 460 had the following permitted storage areas. All RCRA units have been closed in accordance with the "RCRA Closure Plan for the B460 Process Waste System"

39.03 - Fabric Filtration Unit
40.08 - Process Waste Tank T-1
40.09 - Process Waste Tank T-2
40.10 - Filter System Collection Tank T-4
40.11 - Sump Tank ST-1
40.12 - Sump Tank ST-2
40.13 - Sump Tank ST-3
40.14 - Sump Tank ST-4
40.15 - Sump Tank ST-5

Building 460 has the following current permit - MS001- B460 Containerized Storage. This permit is a temporary permit. The final permit is expected to be approved later this year.

Describe any potential, likely, or known spill locations (and sources, if any):

See the Environmental Concerns section below for information about RCRA/CERCLA spills.

Describe methods in which spills were mitigated, if any:

See the Environmental Concerns section below for information about RCRA/CERCLA spills.

PCBs

Describe any potential, likely, or known sources of PCBs (e.g., light ballasts, paints, equipment, etc.):

No PCB containing process where housed in any of the facilities addressed in this HSA. Based on the age of construction of some of these facilities, PCBs in paint may be a concern.

Describe any potential, likely, or known spill locations (and sources, if any):

No PCB spills occurred in any of the facilities addressed in this HSA.

Describe methods in which spills were mitigated, if any:

No PCB spills occurred in any of the facilities addressed in this HSA.

Radiological Contaminants

Describe any potential, likely, or known radiological production or storage locations:

Building 460 recently became a LLW storage facility. In the past Building 668 housed fiberglass operations used to seal LLW waste crates. Historically, Building 439 was primarily a machine shop in support of Building 440 operation. The UBC section of the HRR states that uranium, on limited occasions, may have been handled in Building 439. No evidence of this was found. See the Historical operations section above for a more detailed listing of the operations which occurred in the facilities addressed in this HSA.

Describe any potential, likely, or known spill locations (e.g., known leaking sealed radioactive sources, leaking waste drums, potentially contaminated drains, etc.):

None of the facilities in this HSA have had a radiological spill.

Describe methods in which spills were mitigated, f any:

None of the facilities in this HSA have had a radiological spill.

Describe any potential, likely, or known isotopes of concern (e.g., weapons grade plutonium, uranium isotopes, pure beta emitters, mixed fission products, etc.):

Isotopes of concern include uranium and plutonium.

Describe any potential, likely, or known external facility contamination (e.g., stack release points, unfiltered ventilation, facility's physical location to known site releases, etc.):

See section below for information on IHSSs PACs, and UBCs.

Environmental Restoration Concerns

Describe any ER concerns that could affect facility characterization (e.g., IHSSs, PACs, UBCs):

Building 460 is associated with or located near the following IHSSs, PACs, or UBCs. See individual IHSS, PAC, or UBC report for additional information.

1) 400-136.1, "Cooling Tower Pond East of Building 444", Active.
2) 400-157.2, "Radioactive site South Area", Active.
3) 400-205, "Building 460 Sump No. 3, Acid Side". Active.
4) 400-804, "Road North of Building 460", Active.
5) 400-812, "Tank T-2 Spill in Building 460, Proposed NFA in 2001.
6) 400-813, "RCRA Tank Leak in Building 460, Active.
7) 400-815, "RCRA Tank Leak in Building 460, Active.

Building 439 is associated with or located near the following IHSSs, PACs, or UBCs. See individual IHSS, PAC, or UBC report for additional information.

1) 400-157.2, "Radioactive site South Area", Active.

Building 439 is identified as a UBC because it housed modification and machining operations, which may have involved deleted uranium or beryllium.

Building 668 is associated with or located near the following IHSSs, PACs, or UBCs. See individual IHSS, PAC, or UBC report for additional information.

1) 600-120.1, "Fiberglass area north of Building 664 ", Active.

Building 462, and Trailer T664A are not associated any IHSS, PAC, or UBC

Additional Information

Describe any additional information that may be useful during facility characterization (e.g., contaminant migration routes, waste handling operations, physical hazards, Historical Release Reports, WSRIC data, etc.):

None

References

Provide all sources of information utilized to gather data for facility history (e.g., documents, files, interviews):

Sources reviewed to complete this HSA were the RFETS Facility List, the Historical Release Report, Site Master List of RCRA Units, and the Site IHSS, PAC, and UBC databases. The WSRIC for those buildings with a WSRIC. In addition, a facility walkdown and interviews were performed.

30

Waste Volume Estimates and Material Types							
Facility	Concrete (cu ft)	Wood (cu ft)	Metal (cu ft)	Corrugated Sheet Metal (cu ft)	Wall Board (cu ft)	ACM (cu ft)	Other Waste (cu ft)
Building 460	42,400	0	73,000	24,000	20,600	TBD	N/A
Building 439	2500	0	1200	1600	300	TBD	N/A
Building 462	250	0	1000	0	0	TBD	N/A
Building 668	750	1000	100	0	0	TBD	N/A
Trailer T664A	0	1,100	800	1000	1,500	TBD	N/A

Further Actions

Recommend any further actions, if any (e.g., characterization, decontamination, special handling, etc.):

Begin the RLC/PDS process.

Note:

This HSA was performed prior to SME walkdowns, and chemical and radiological characterization package preparations. SMEs should evaluate and/or verify all information during the RLC/PDS process. SMEs may need to review additional documentation and perform additional interviews. Information contained in this HSA only represents a "snapshot" in time. Subsequent data may be obtained during SME walkdowns and chemical and radiological characterization package preparations, which may conflict with this report. However, this report will not be amended, and the newer data will take precedence over the data in this report. Newer Data will appear in the RLCR/PDSR.

Prepared By: Doug Bryant / /s/ / October 2002

Name Signature Date

31

ATTACHMENT C

Radiological Data Summaries and Survey Maps

Survey Area: 5	Survey Unit: 664501	Building: 664

Description: Building 664 Interior, all surfaces

Rocky Flats Environmental Technology Site
Final Radiological Survey Summary Results

Total Surface Activity Measurements

Nbr Random Measurements Required: 28 | Nbr Biased Measurements Required: 59 | Nbr QC Required: 2

Nbr Random Measurements Performed: 29 | Nbr Biased Measurements Performed: 59 | Nbr QC Performed: 2

Alpha

Maximum:	33.9 dpm/100cm²
Minimum:	-7.3 dpm/100cm²
Mean:	10.7 dpm/100cm²
Standard Deviation:	8.7
QC Maximum:	22.9 dpm/100cm²
QC Minimum:	15.0 dpm/100cm²
QC Mean:	18.9 dpm/100cm²
Transuranic DCGL$_W$:	100.0 dpm/100cm²
Transuranic DCGL$_{EMC}$:	300.0 dpm/100cm²

Removable Surface Activity Measurements

Nbr Random Measurements Required: 28 | Nbr Biased Measurements Required: 59

Nbr Random Measurements Performed: 29 | Nbr Biased Measurements Performed: 59

Alpha

Maximum:	2.9 dpm/100cm²
Minimum:	0.0 dpm/100cm²
Mean:	0.7 dpm/100cm²
Standard Deviation:	0.9
Transuranic DCGL$_W$:	20.0 dpm/100cm²

Media Sample Results

Nbr Random Required: 0 | Nbr Biased Required: 0

Nbr Random Collected: 0 | Nbr Biased Collected: 0

Conclusion - A comparison of the random, biased and QC measurement results against the PDSP Table 7-1 Surface Contamination Guideline limits was conducted; the comparison demonstrates that this survey unit passes the criterion specified in the PDSP.

Survey Area: 5	Survey Unit: 664501	Building: 664

Description: Building 664 Interior, all surfaces

Instrument Data Sheet

Inst/RCT Number	RCT ID	Analysis Date	Instr Model	Instru S/N	Probe Type	Calibration Due Dt	Instru Efficiency		A-Priori MDA (dpm/100cm²)		Survey Type
							Alpha	Beta	Alpha	Beta	
1	712467	10/12/04	Electra	2404	DP-8	02/03/05	0.157	0.160	48.0	999.0	S
2	712193	10/12/04	Electra	662	DP-6	03/30/05	0.211	NA	48.0	NA	T/S
3	712467	10/13/04	Electra	2404	DP-8	02/03/05	0.157	0.160	48.0	999.0	S
4	712193	10/13/04	Electra	662	DP-6	03/30/05	0.211	NA	48.0	NA	T/S
5	712467	10/13/04	Electra	3250	DP-6	02/14/05	0.203	NA	48.0	NA	Q/S
6	712193	10/13/04	Ludlum 292	99042	NA	10/26/04	0.349	NA	10.0	NA	R

Survey Types: T = Total Surface Activity, Q = TSA QC, S = Scan, R = Removable Surface Activity, I = Investigation

Survey Area: 5	Survey Unit: 664501	Building: 664

Description: Building 664 Interior, all surfaces

Random Removable Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	
664501PRP-N001	6	1.4	N/A	
664501PRP-N002	6	0.0	N/A	
664501PRP-N003	6	1.4	N/A	
664501PRP-N004	6	1.4	N/A	
664501PRP-N005	6	0.0	N/A	
664501PRP-N006	6	0.0	N/A	
664501PRP-N007	6	1.4	N/A	
664501PRP-N008	6	0.0	N/A	
664501PRP-N009	6	1.4	N/A	
664501PRP-N010	6	2.9	N/A	
664501PRP-N011	6	0.0	N/A	
664501PRP-N012	6	0.0	N/A	
664501PRP-N013	6	1.4	N/A	
664501PRP-N014	6	0.0	N/A	
664501PRP-N015	6	0.0	N/A	
664501PRP-N016	6	0.0	N/A	
664501PRP-N017	6	1.4	N/A	
664501PRP-N018	6	1.4	N/A	
664501PRP-N019	6	0.0	N/A	
664501PRP-N020	6	0.0	N/A	
664501PRP-N021	6	1.4	N/A	
664501PRP-N022	6	0.0	N/A	
664501PRP-N023	6	1.4	N/A	
664501PRP-N024	6	0.0	N/A	
664501PRP-N025	6	0.0	N/A	
664501PRP-N026	6	2.9	N/A	
664501PRP-N027	6	0.0	N/A	
664501PRP-N028	6	1.4	N/A	
664501PRP-N029	6	1.4	N/A	

Survey Area: 5	Survey Unit: 664501	Building: 664

Description: Building 664 Interior, all surfaces

Biased Removable Surface Activity Data Sheet

Biased Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	
664501PBP-N030	6	0.0	N/A	
664501PBP-N031	6	0.0	N/A	
664501PBP-N032	6	0.0	N/A	
664501PBP-N033	6	1.4	N/A	
664501PBP-N034	6	0.0	N/A	
664501PBP-N035	6	0.0	N/A	
664501PBP-N036	6	0.0	N/A	
664501PBP-N037	6	0.0	N/A	
664501PBP-N038	6	0.0	N/A	
664501PBP-N039	6	1.4	N/A	
664501PBP-N040	6	0.0	N/A	
664501PBP-N041	6	0.0	N/A	
664501PBP-N042	6	1.4	N/A	
664501PBP-N043	6	0.0	N/A	
664501PBP-N044	6	0.0	N/A	
664501PBP-N045	6	0.0	N/A	
664501PBP-N046	6	1.4	N/A	
664501PBP-N047	6	1.4	N/A	
664501PBP-N048	6	1.4	N/A	
664501PBP-N049	6	0.0	N/A	
664501PBP-N050	6	0.0	N/A	
664501PBP-N051	6	1.4	N/A	
664501PBP-N052	6	0.0	N/A	
664501PBP-N053	6	1.4	N/A	
664501PBP-N054	6	1.4	N/A	
664501PBP-N055	6	0.0	N/A	
664501PBP-N056	6	0.0	N/A	

Survey Area: 5	Survey Unit: 664501	Building: 664

Description: Building 664 Interior, all surfaces

Biased Removable Surface Activity Data Sheet

Biased Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	
664501PBP-N057	6	0.0	N/A	
664501PBP-N058	6	0.0	N/A	
664501PBP-N059	6	2.9	N/A	
664501PBP-N060	6	0.0	N/A	
664501PBP-N061	6	2.9	N/A	
664501PBP-N062	6	0.0	N/A	
664501PBP-N063	6	0.0	N/A	
664501PBP-N064	6	1.4	N/A	
664501PBP-N065	6	1.4	N/A	
664501PBP-N066	6	0.0	N/A	
664501PBP-N067	6	1.4	N/A	
664501PBP-N068	6	0.0	N/A	
664501PBP-N069	6	1.4	N/A	
664501PBP-N070	6	1.4	N/A	
664501PBP-N071	6	1.4	N/A	
664501PBP-N072	6	0.0	N/A	
664501PBP-N073	6	0.0	N/A	
664501PBP-N074	6	0.0	N/A	
664501PBP-N075	6	0.0	N/A	
664501PBP-N076	6	1.4	N/A	
664501PBP-N077	6	0.0	N/A	
664501PBP-N078	6	1.4	N/A	
664501PBP-N079	6	0.0	N/A	
664501PBP-N080	6	0.0	N/A	
664501PBP-N081	6	1.4	N/A	
664501PBP-N082	6	1.4	N/A	
664501PBP-N083	6	2.9	N/A	

Survey Area: 5	Survey Unit: 664501	Building: 664

Description: Building 664 Interior, all surfaces

Biased Removable Surface Activity Data Sheet

Biased Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	
664501PBP-N084	6	0.0	N/A	
664501PBP-N085	6	0.0	N/A	
664501PBP-N086	6	0.0	N/A	
664501PBP-N087	6	2.9	N/A	
664501PBP-N088	6	1.4	N/A	

Comments:

Survey Area: 5	Survey Unit: 664501	Building: 664

Description: Building 664 Interior, all surfaces

Random/QC Total Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	
664501PRP-N001	2	11.1	N/A	
664501PRP-N002	2	7.8	N/A	
664501PRP-N003	2	3.0	N/A	
664501PRP-N004	4	3.0	N/A	
664501PRP-N005	2	-0.3	N/A	
664501PRP-N006	2	3.0	N/A	
664501PRP-N007	2	13.9	N/A	
664501PRP-N008	2	1.6	N/A	
664501PRP-N009	2	9.2	N/A	
664501PRP-N010	2	17.2	N/A	
664501PRP-N011	2	15.8	N/A	
664501PRP-N012	2	20.6	N/A	
664501PRP-N013	2	4.4	N/A	
664501PRP-N014	2	26.7	N/A	
664501QRP-N014	5	22.9	N/A	
664501PRP-N015	2	11.1	N/A	
664501PRP-N016	2	-1.7	N/A	
664501PRP-N017	2	-0.3	N/A	
664501PRP-N018	2	3.0	N/A	
664501PRP-N019	2	7.8	N/A	
664501PRP-N020	2	17.2	N/A	
664501PRP-N021	2	20.6	N/A	
664501QRP-N021	5	15.0	N/A	
664501PRP-N022	2	23.4	N/A	
664501PRP-N023	2	12.5	N/A	
664501PRP-N024	2	9.2	N/A	
664501PRP-N025	4	6.3	N/A	

Survey Area: 5	Survey Unit: 664501	Building: 664

Description: Building 664 Interior, all surfaces

Random/QC Total Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	
664501PRP-N026	4	4.4	N/A	
664501PRP-N027	4	3.0	N/A	
664501PRP-N028	2	4.4	N/A	
664501PRP-N029	4	6.3	N/A	

Biased Total Surface Activity Data Sheet

Biased Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	
664501PBP-N030	4	5.5	N/A	
664501PBP-N031	4	16.4	N/A	
664501PBP-N032	4	23.0	N/A	
664501PBP-N033	4	5.5	N/A	
664501PBP-N034	4	13.5	N/A	
664501PBP-N035	4	19.7	N/A	
664501PBP-N036	4	18.3	N/A	
664501PBP-N037	4	23.0	N/A	
664501PBP-N038	4	11.6	N/A	
664501PBP-N039	4	24.4	N/A	
664501PBP-N040	4	8.8	N/A	
664501PBP-N041	4	-4.0	N/A	
664501PBP-N042	4	4.0	N/A	
664501PBP-N043	4	10.2	N/A	
664501PBP-N044	4	14.9	N/A	
664501PBP-N045	4	27.7	N/A	
664501PBP-N046	4	6.9	N/A	
664501PBP-N047	4	18.3	N/A	
664501PBP-N048	4	10.2	N/A	

Survey Area: 5	Survey Unit: 664501	Building: 664

Description: Building 664 Interior, all surfaces

Biased Total Surface Activity Data Sheet

Biased Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	
664501PBP-N049	4	21.1	N/A	
664501PBP-N050	4	-7.3	N/A	
664501PBP-N051	4	-4.0	N/A	
664501PBP-N052	4	27.7	N/A	
664501PBP-N053	4	21.1	N/A	
664501PBP-N054	4	11.6	N/A	
664501PBP-N055	4	5.5	N/A	
664501PBP-N056	4	8.8	N/A	
664501PBP-N057	4	-0.7	N/A	
664501PBP-N058	4	11.6	N/A	
664501PBP-N059	4	-7.3	N/A	
664501PBP-N060	4	19.7	N/A	
664501PBP-N061	4	8.8	N/A	
664501PBP-N062	4	14.9	N/A	
664501PBP-N063	4	13.5	N/A	
664501PBP-N064	4	18.3	N/A	
664501PBP-N065	4	21.1	N/A	
664501PBP-N066	4	24.4	N/A	
664501PBP-N067	4	5.5	N/A	
664501PBP-N068	4	21.1	N/A	
664501PBP-N069	4	33.9	N/A	
664501PBP-N070	4	24.4	N/A	
664501PBP-N071	4	6.9	N/A	
664501PBP-N072	4	14.9	N/A	
664501PBP-N073	4	10.2	N/A	
664501PBP-N074	4	8.8	N/A	
664501PBP-N075	4	-2.6	N/A	

41

Survey Area: 5	Survey Unit: 664501	Building: 664

Description: Building 664 Interior, all surfaces

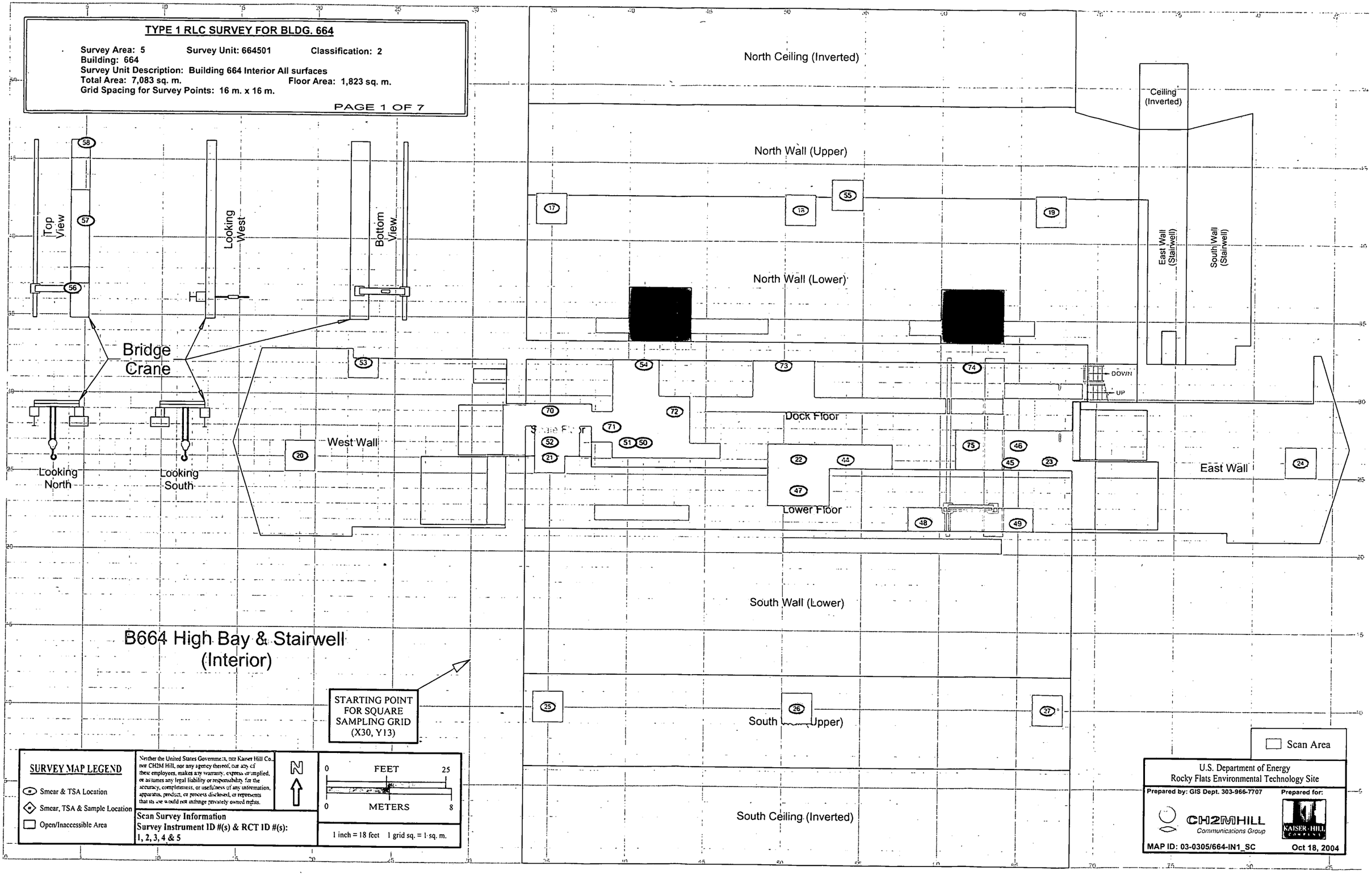
Biased Total Surface Activity Data Sheet

Biased Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	
664501PBP-N076	4	0.7	N/A	
664501PBP-N077	4	8.8	N/A	
664501PBP-N078	4	8.8	N/A	
664501PBP-N079	4	6.9	N/A	
664501PBP-N080	4	0.7	N/A	
664501PBP-N081	4	14.9	N/A	
664501PBP-N082	4	6.9	N/A	
664501PBP-N083	4	5.5	N/A	
664501PBP-N084	4	4.0	N/A	
664501PBP-N085	4	11.6	N/A	
664501PBP-N086	4	5.5	N/A	
664501PBP-N087	4	0.7	N/A	
664501PBP-N088	4	16.4	N/A	

Comments:

TYPE 1 RLC SURVEY FOR BLDG. 664

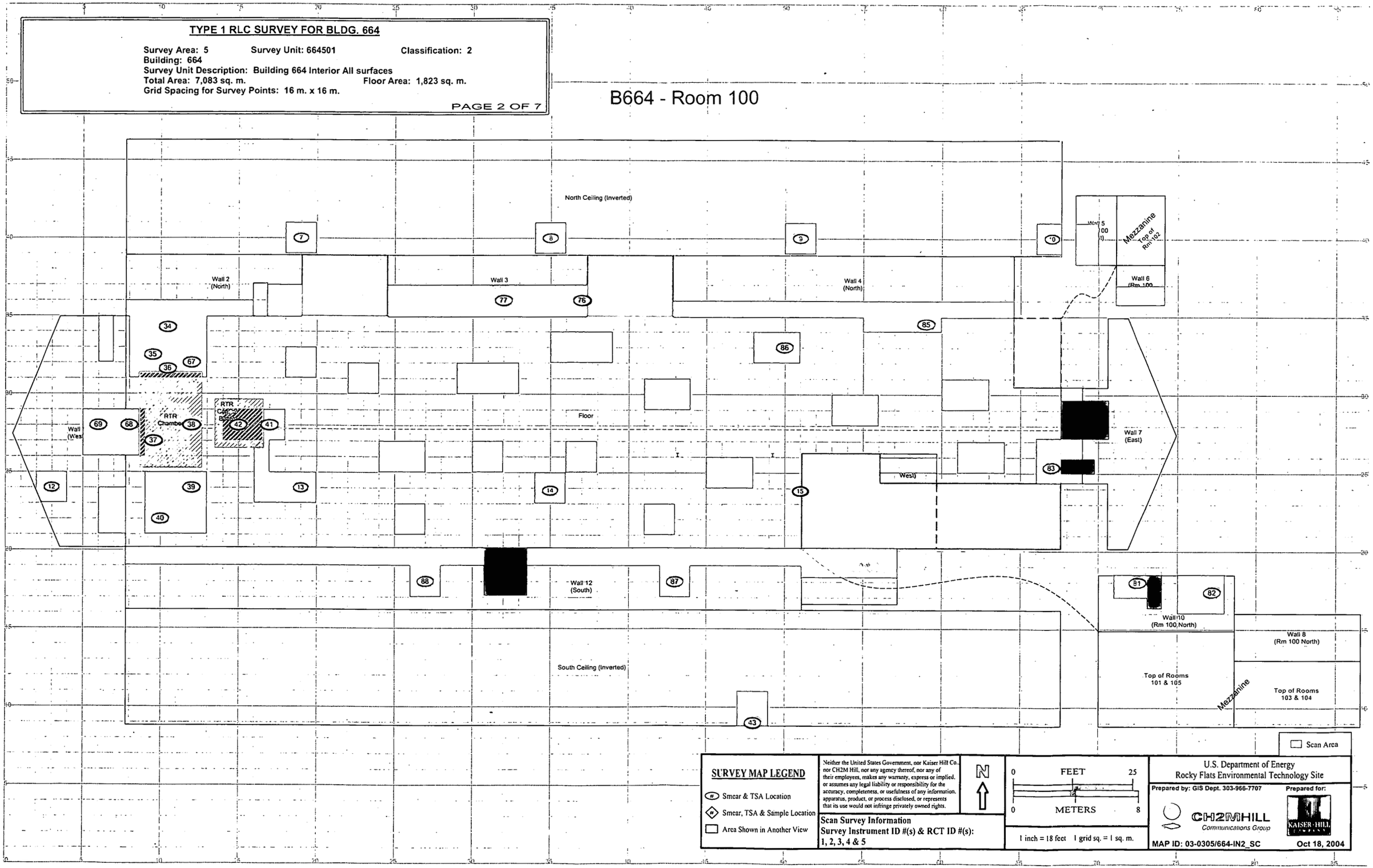
Survey Area: 5 Survey Unit: 664501 Classification: 2
Building: 664
Survey Unit Description: Building 664 Interior All surfaces
Total Area: 7,083 sq. m. Floor Area: 1,823 sq. m.
Grid Spacing for Survey Points: 16 m. x 16 m.



TYPE 1 RLC SURVEY FOR BLDG. 664

Survey Area: 5 Survey Unit: 664501 Classification: 2
Building: 664
Survey Unit Description: Building 664 Interior All surfaces
Total Area: 7,083 sq. m. Floor Area: 1,823 sq. m.
Grid Spacing for Survey Points: 16 m. x 16 m.

B664 - Room 100



SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Area Shown in Another View

N

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):
1, 2, 3, 4 & 5

0 FEET 25
0 METERS 8

1 inch = 18 feet 1 grid sq. = 1 sq. m.

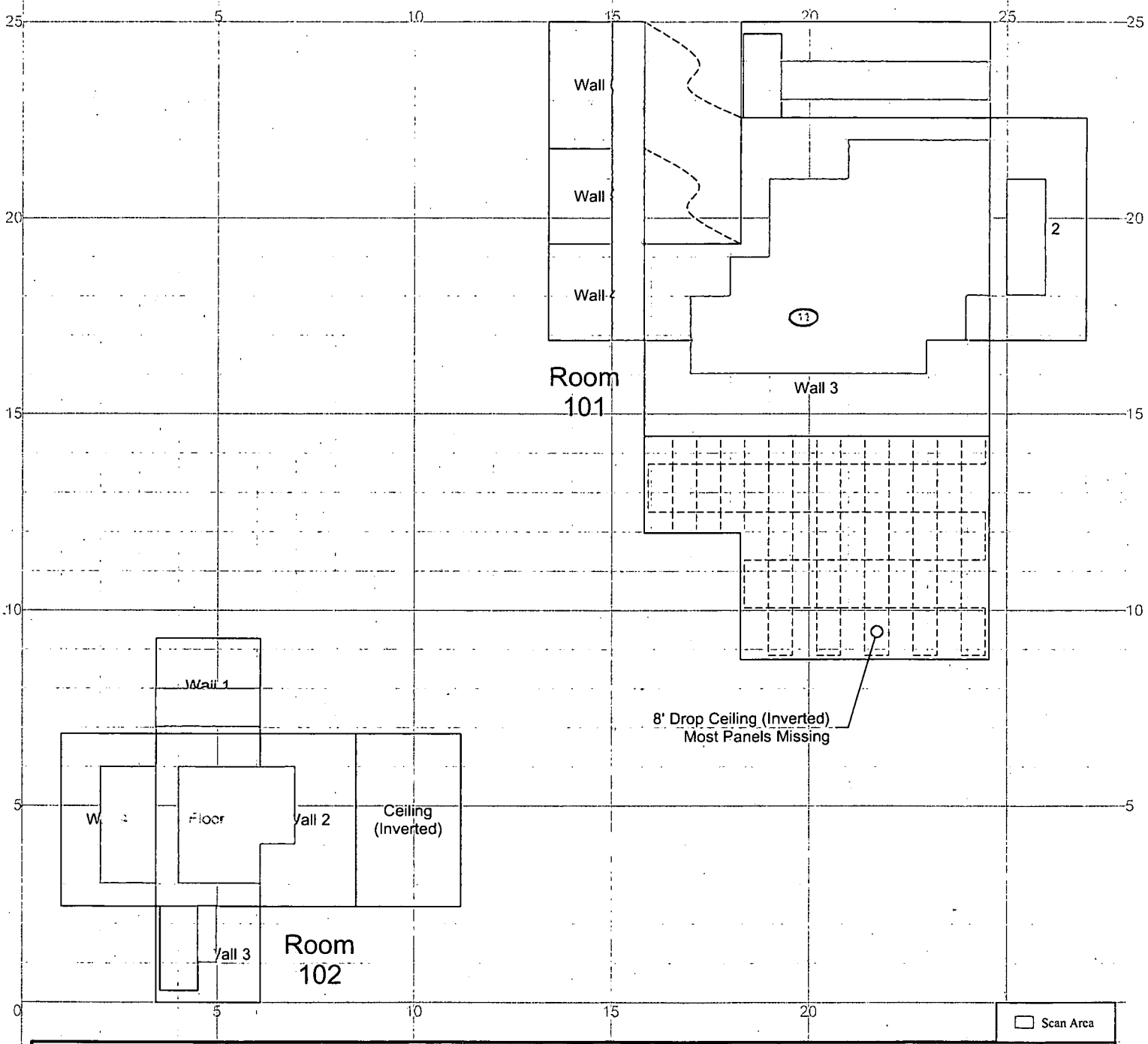
U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707
CH2MHILL Communications Group
Prepared for: KAISER-HILL

MAP ID: 03-0305/664-IN2_SC Oct 18, 2004

TYPE 1 RLC SURVEY FOR BLDG. 664

Survey Area: 5 **Survey Unit: 664501** **Classification: 2**
Building: 664
Survey Unit Description: Building 664 Interior All surfaces
Total Area: 7,083 sq. m. **Floor Area: 1,823 sq. m.**
Grid Spacing for Survey Points: 16 m. x 16 m.



Scan Area

SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 15
0 METERS 5

1 inch = 12 feet 1 grid sq. = 1 sq. m.

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):
1, 2, 3, 4 & 5

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707 Prepared for:

CH2MHILL Communications Group

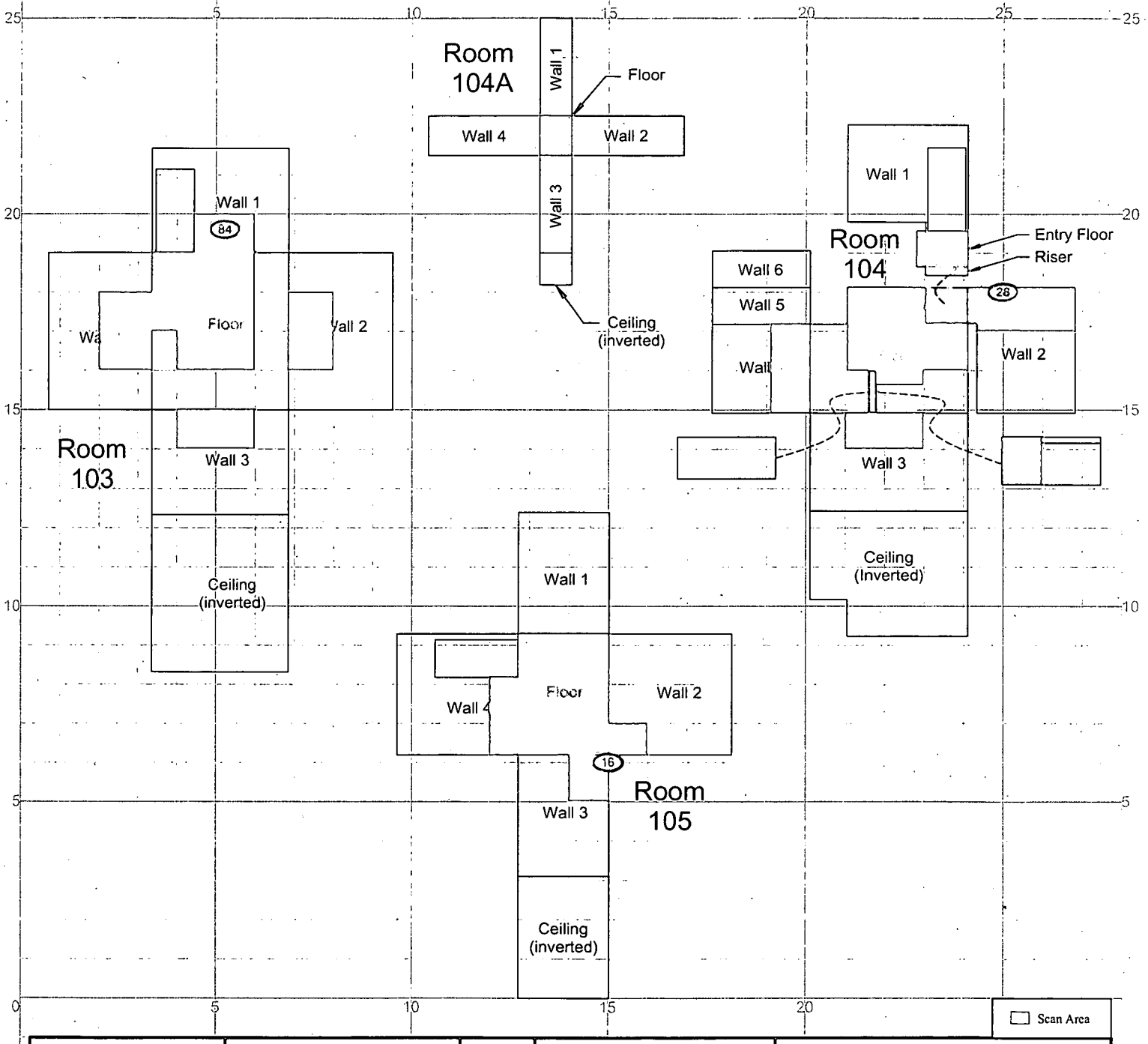
KAISER HILL COMPANY

MAP ID: 03-0305/664-IN3_SC Oct 18, 2004

45

TYPE 1 RLC SURVEY FOR BLDG. 664

Survey Area: 5 **Survey Unit: 664501** **Classification: 2**
Building: 664
Survey Unit Description: Building 664 Interior All surfaces
Total Area: 7,083 sq. m. **Floor Area: 1,823 sq. m.**
Grid Spacing for Survey Points: 16 m. x 16 m.



Scan Area

SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area Shown in Another View

N

0 FEET 15
0 METERS 5

1 inch = 12 feet 1 grid sq. = 1 sq. m.

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):
1, 2, 3, 4 & 5

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707 Prepared for:

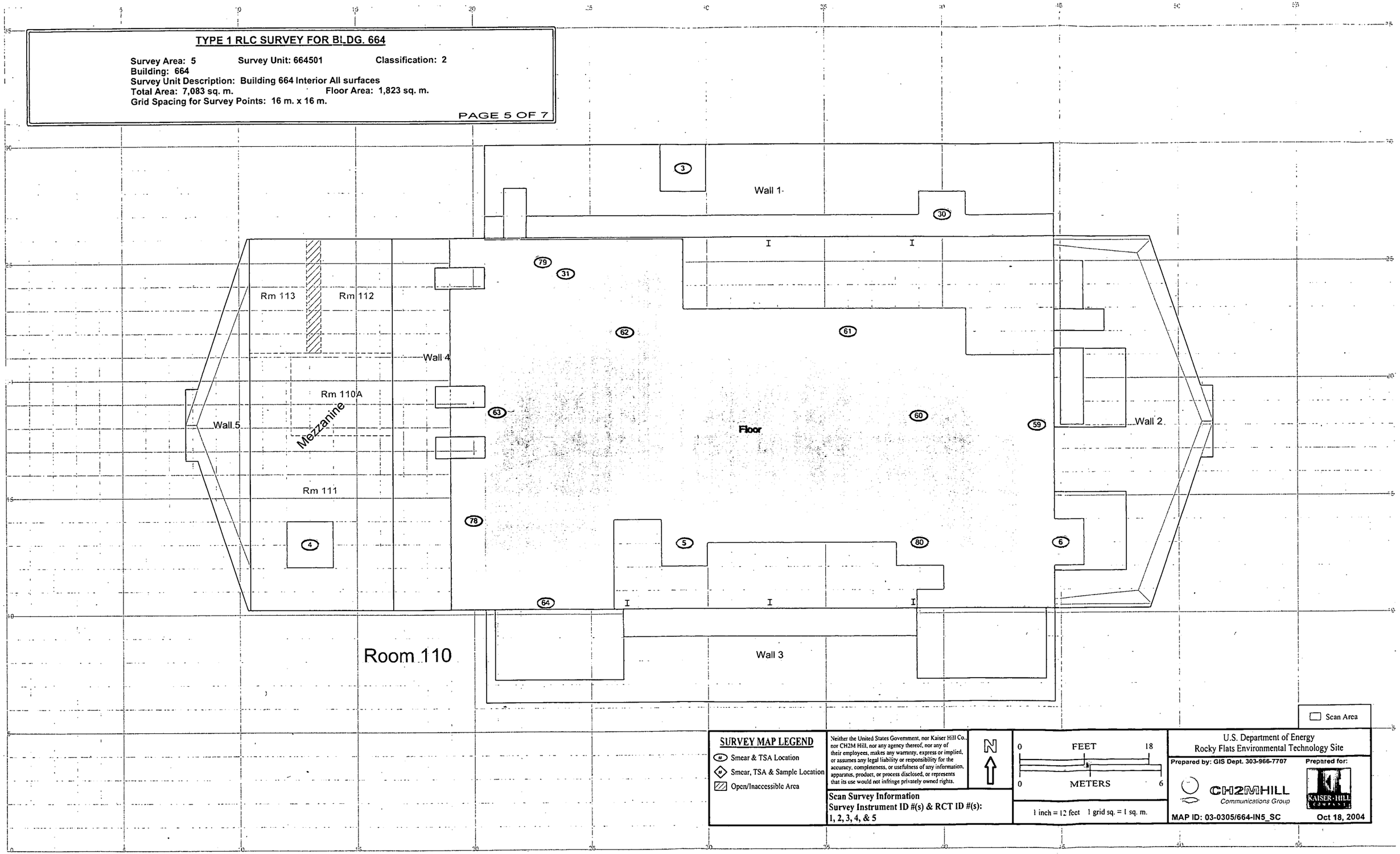
CH2MHILL Communications Group

KAISER-HILL COMPANY

MAP ID: 03-0305/664-IN4_SC Oct 18, 2004

TYPE 1 RLC SURVEY FOR BLDG. 664

Survey Area: 5 **Survey Unit:** 664501 **Classification:** 2
Building: 664
Survey Unit Description: Building 664 Interior All surfaces
Total Area: 7,083 sq. m. **Floor Area:** 1,823 sq. m.
Grid Spacing for Survey Points: 16 m. x 16 m.



SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area

N

0 FEET 18
0 METERS 6

1 inch = 12 feet 1 grid sq. = 1 sq. m.

Scan Area

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):
1, 2, 3, 4, & 5

U.S. Department of Energy
Rocky Flats Environmental Technology Site

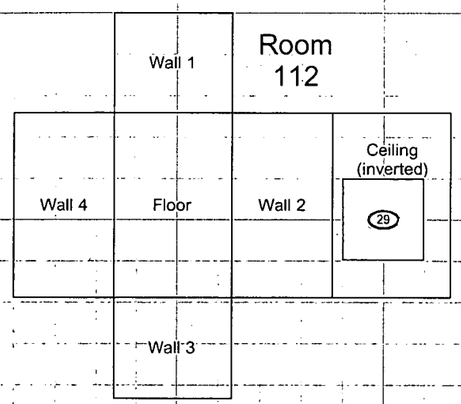
Prepared by: GIS Dept. 303-966-7707
CH2MHILL Communications Group

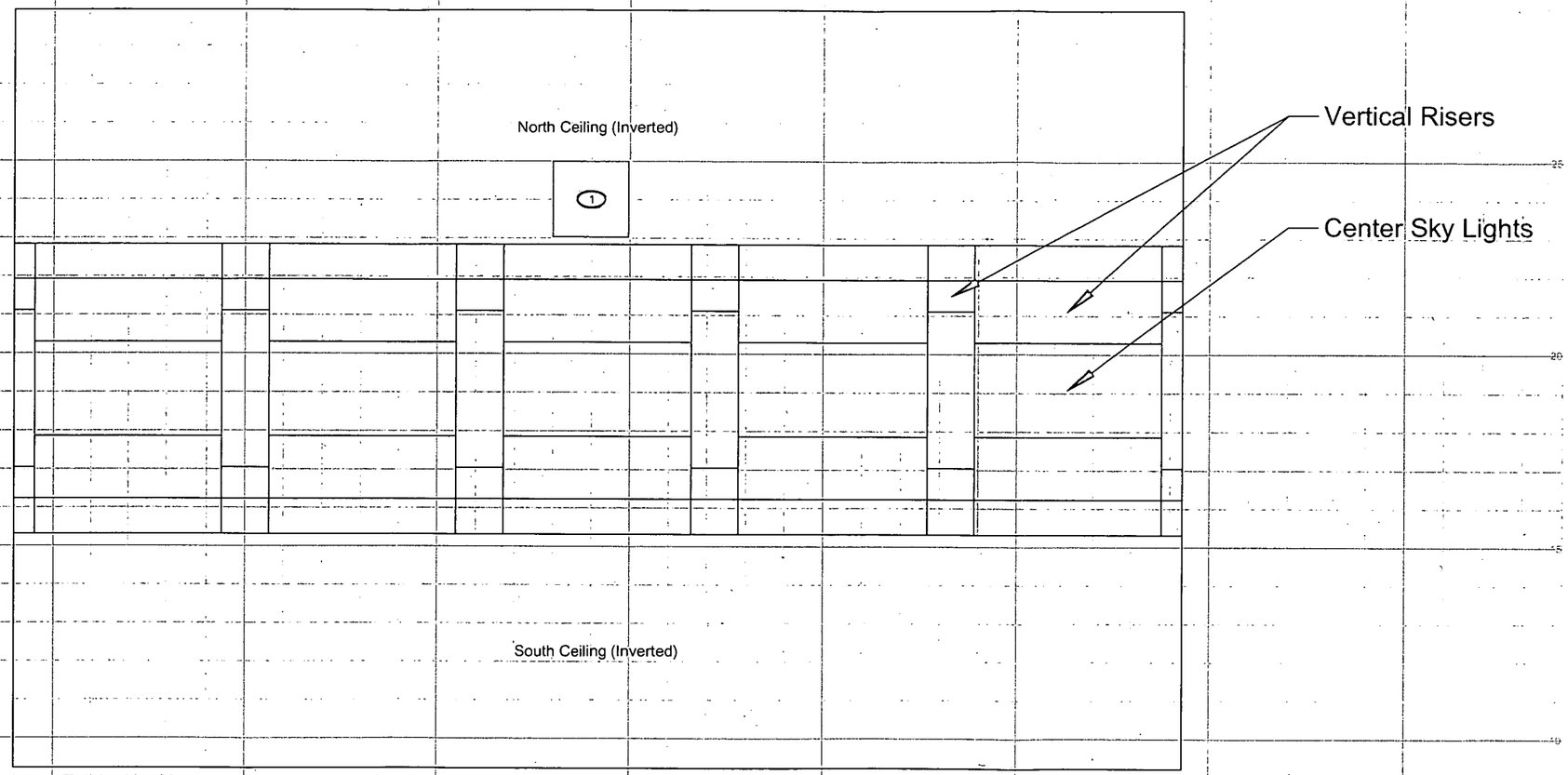
Prepared for: KAISER-HILL COMPANY

MAP ID: 03-0305/664-IN5_SC **Oct 18, 2004**

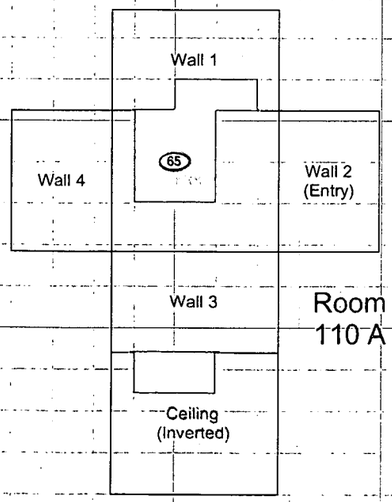
TYPE 1 RLC SURVEY FOR BLDG. 664

Survey Area: 5 **Survey Unit: 664501** **Classification: 2**
Building: 664
Survey Unit Description: Building 664 Interior All surfaces
Total Area: 7,083 sq. m. **Floor Area: 1,823 sq. m.**
Grid Spacing for Survey Points: 16 m. x 16 m.





Room 110 Ceiling (Inverted)



Scan Area

SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 18
0 METERS 6

1 inch = 12 feet 1 grid sq. = 1 sq. m.

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):
1, 2, 3, 4 & 5

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

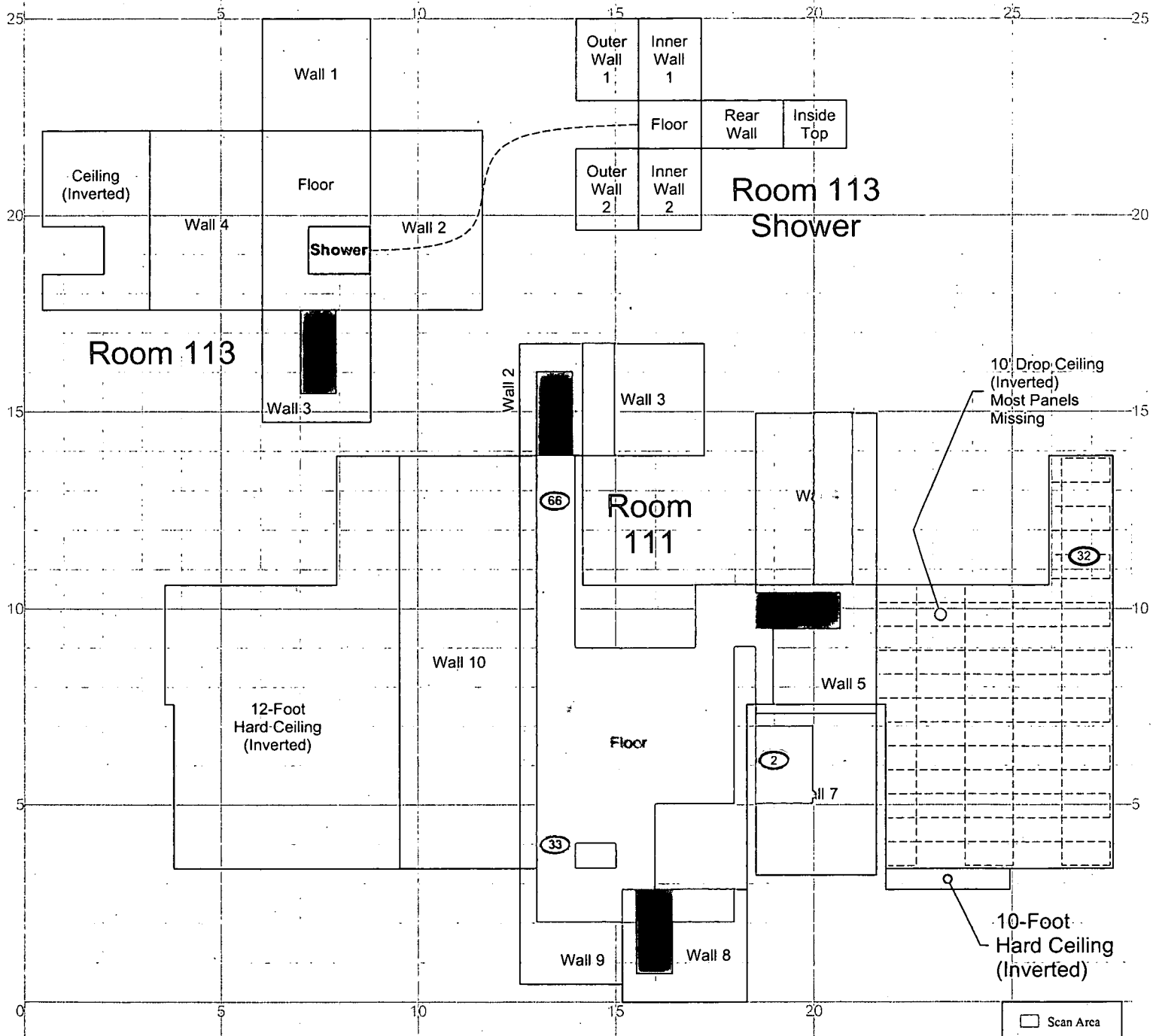
CH2MHILL
Communications Group

Prepared for:
KAISER-HILL COMPANY

MAP ID: 03-0305/664-IN6_SC Oct 18, 2004

TYPE 1 RLC SURVEY FOR BLDG. 664

Survey Area: 5 **Survey Unit: 664501** **Classification: 2**
Building: 664
Survey Unit Description: Building 664 Interior All surfaces
Total Area: 7,083 sq. m. **Floor Area: 1,823 sq. m.**
Grid Spacing for Survey Points: 16 m. x 16 m.



SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area Shown in Another View

N

0 FEET 15
0 METERS 5

1 inch = 12 feet 1 grid sq. = 1 sq. m.

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):
1, 2, 3, 4 & 5

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707 **Prepared for:**

CH2MHILL Communications Group

KAISER-HILL COMPANY

MAP ID: 03-0305/664-IN7_SC **Oct 18, 2004**

Survey Area: 5	Survey Unit: 664A06	Building: T664A

Description: T664A Interior, all surfaces

Rocky Flats Environmental Technology Site
Final Radiological Survey Summary Results

Total Surface Activity Measurements

Nbr Random Measurements Required: 15 | Nbr Biased Measurements Required: 10 | Nbr QC Required: 2

Nbr Random Measurements Performed: 15 | Nbr Biased Measurements Performed: 10 | Nbr QC Performed: 2

Alpha

Maximum:	31.6 dpm/100cm²
Minimum:	-1.6 dpm/100cm²
Mean:	10.9 dpm/100cm²
Standard Deviation:	9.3
QC Maximum:	27.6 dpm/100cm²
QC Minimum:	17.8 dpm/100cm²
QC Mean:	22.7 dpm/100cm²
Transuranic DCGL$_W$:	100.0 dpm/100cm²
Transuranic DCGL$_{EMC}$:	300.0 dpm/100cm²

Removable Surface Activity Measurements

Nbr Random Measurements Required: 15 | Nbr Biased Measurements Required: 10

Nbr Random Measurements Performed: 15 | Nbr Biased Measurements Performed: 10

Alpha

Maximum:	2.6 dpm/100cm²
Minimum:	-0.3 dpm/100cm²
Mean:	0.4 dpm/100cm²
Standard Deviation:	0.9
Transuranic DCGL$_W$:	20.0 dpm/100cm²

Media Sample Results

Nbr Random Required: 0 | Nbr Biased Required: 0

Nbr Random Collected: 0 | Nbr Biased Collected: 0

Conclusion - A comparison of the random, biased and QC measurement results against the PDSP Table 7-1 Surface Contamination Guideline limits was conducted; the comparison demonstrates that this survey unit passes the criterion specified in the PDSP.

Survey Area: 5	Survey Unit: 664A06	Building: T664A

Description: T664A Interior, all surfaces

Instrument Data Sheet

Inst/RCT Number	RCT ID	Analysis Date	Instr Model	Instru S/N	Probe Type	Calibration Due Dt	Instru Efficiency		A-Priori MDA (dpm/100cm²)		Survey Type
							Alpha	Beta	Alpha	Beta	
1	712467	10/14/04	Electra	1261	DP-8	02/26/05	0.170	NA	48.0	NA	S
2	712193	10/14/04	Electra	662	DP-6	03/03/05	0.211	NA	48.0	NA	T/S
3	712467	10/14/04	Electra	1417	DP-6	03/23/05	0.205	NA	48.0	NA	Q/S
4	712193	10/14/04	Ludlum 292	99042	NA	10/26/04	0.349	0.250	NA	10.0	R

Survey Types: T = Total Surface Activity, Q = TSA QC, S = Scan, R = Removable Surface Activity, I = Investigation

Survey Area: 5	Survey Unit: 664A06	Building: T664A

Description: T664A Interior, all surfaces

Random Removable Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	
664A06PRP-N001	4	-0.3	N/A	
664A06PRP-N002	4	-0.3	N/A	
664A06PRP-N003	4	2.6	N/A	
664A06PRP-N004	4	-0.3	N/A	
664A06PRP-N005	4	1.1	N/A	
664A06PRP-N006	4	1.1	N/A	
664A06PRP-N007	4	-0.3	N/A	
664A06PRP-N008	4	1.1	N/A	
664A06PRP-N009	4	1.1	N/A	
664A06PRP-N010	4	-0.3	N/A	
664A06PRP-N011	4	-0.3	N/A	
664A06PRP-N012	4	-0.3	N/A	
664A06PRP-N013	4	-0.3	N/A	
664A06PRP-N014	4	2.6	N/A	
664A06PRP-N015	4	-0.3	N/A	

Survey Area: 5	Survey Unit: 664A06	Building: T664A

Description: T664A Interior, all surfaces

Biased Removable Surface Activity Data Sheet

Biased Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	
664A06PBP-N016	4	1.1	N/A	
664A06PBP-N017	4	-0.3	N/A	
664A06PBP-N018	4	1.1	N/A	
664A06PBP-N019	4	1.1	N/A	
664A06PBP-N020	4	-0.3	N/A	
664A06PBP-N021	4	-0.3	N/A	
664A06PBP-N022	4	-0.3	N/A	
664A06PBP-N023	4	1.1	N/A	
664A06PBP-N024	4	1.1	N/A	
664A06PBP-N025	4	-0.3	N/A	

Comments:

Survey Area: 5	Survey Unit: 664A06	Building: T664A

Description: T664A Interior, all surfaces

Random/QC Total Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	
664A06PRP-N001	2	1.7	N/A	
664A06PRP-N002	2	5.0	N/A	
664A06PRP-N003	2	1.7	N/A	
664A06PRP-N004	2	9.8	N/A	
664A06PRP-N005	2	19.3	N/A	
664A06PRP-N006	2	11.2	N/A	
664A06PRP-N007	2	14.5	N/A	
664A06PRP-N008	2	-1.6	N/A	
664A06PRP-N009	2	-1.6	N/A	
664A06PRP-N010	2	31.6	N/A	
664A06QRP-N010	3	17.8	N/A	
664A06PRP-N011	2	3.1	N/A	
664A06PRP-N012	2	9.8	N/A	
664A06PRP-N013	2	-1.6	N/A	
664A06PRP-N014	2	12.6	N/A	
664A06PRP-N015	2	26.8	N/A	
664A06QRP-N015	3	27.6	N/A	

Survey Area: 5	Survey Unit: 664A06	Building: T664A

Description: T664A Interior, all surfaces

Biased Total Surface Activity Data Sheet

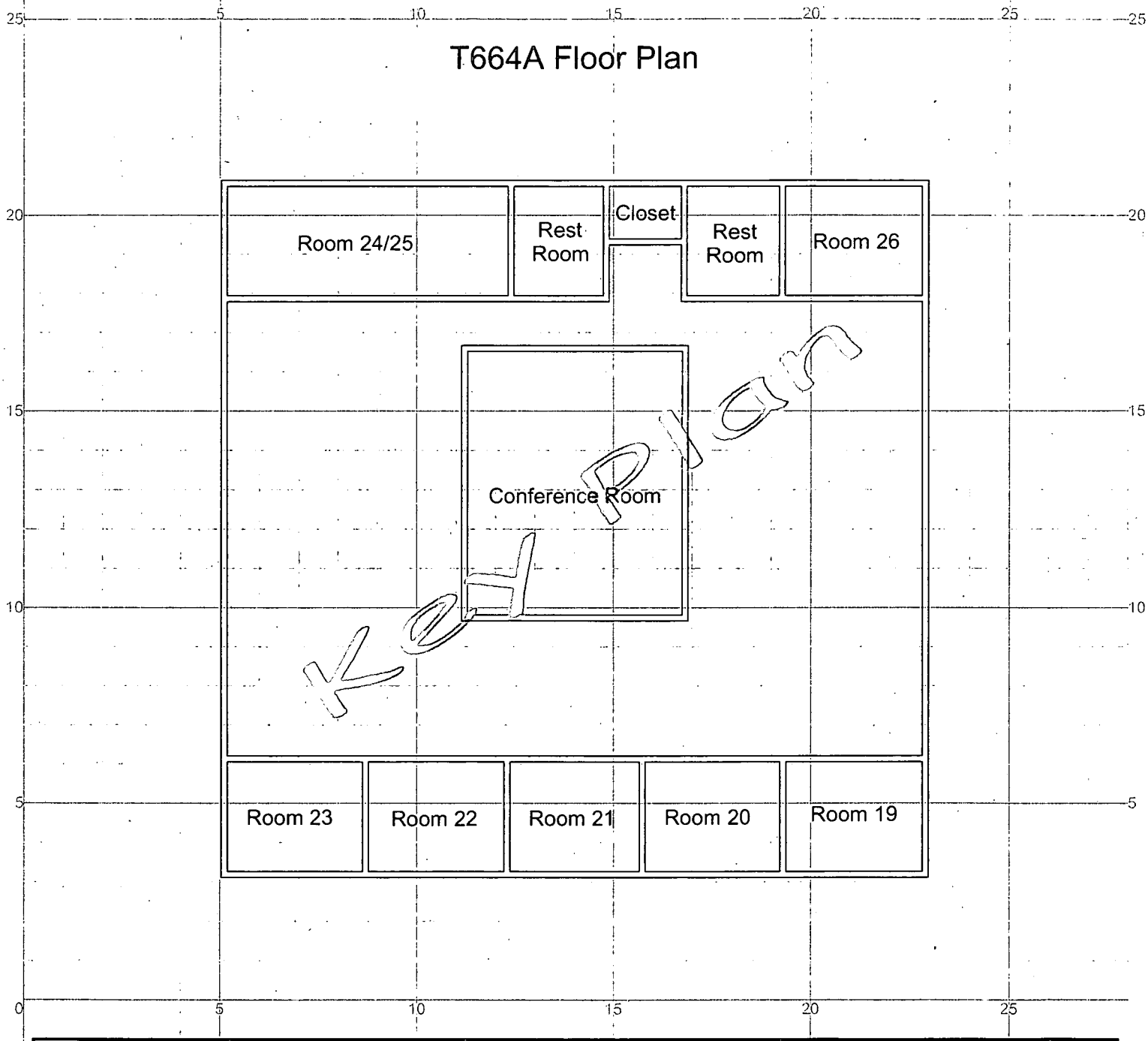
Biased Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm²)	Net Beta (dpm/100cm²)	
664A06PBP-N016	2	14.2	N/A	
664A06PBP-N017	2	23.7	N/A	
664A06PBP-N018	2	17.5	N/A	
664A06PBP-N019	2	25.6	N/A	
664A06PBP-N020	2	8.1	N/A	
664A06PBP-N021	2	1.9	N/A	
664A06PBP-N022	2	8.1	N/A	
664A06PBP-N023	2	16.1	N/A	
664A06PBP-N024	2	8.1	N/A	
664A06PBP-N025	2	8.1	N/A	

Comments:

PRE-DEMOLITION SURVEY FOR T664A

Survey Area: 5 **Survey Unit: 664A06** **Classification: 3**
Building: T664A
Survey Unit Description: Building T664A Interior (All surfaces)
Total Area: 968 sq. m. **Total Floor Area: 298 sq. m.**

T664A Floor Plan



SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 15
0 METERS 5

NOT TO SCALE

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707 **Prepared for:**

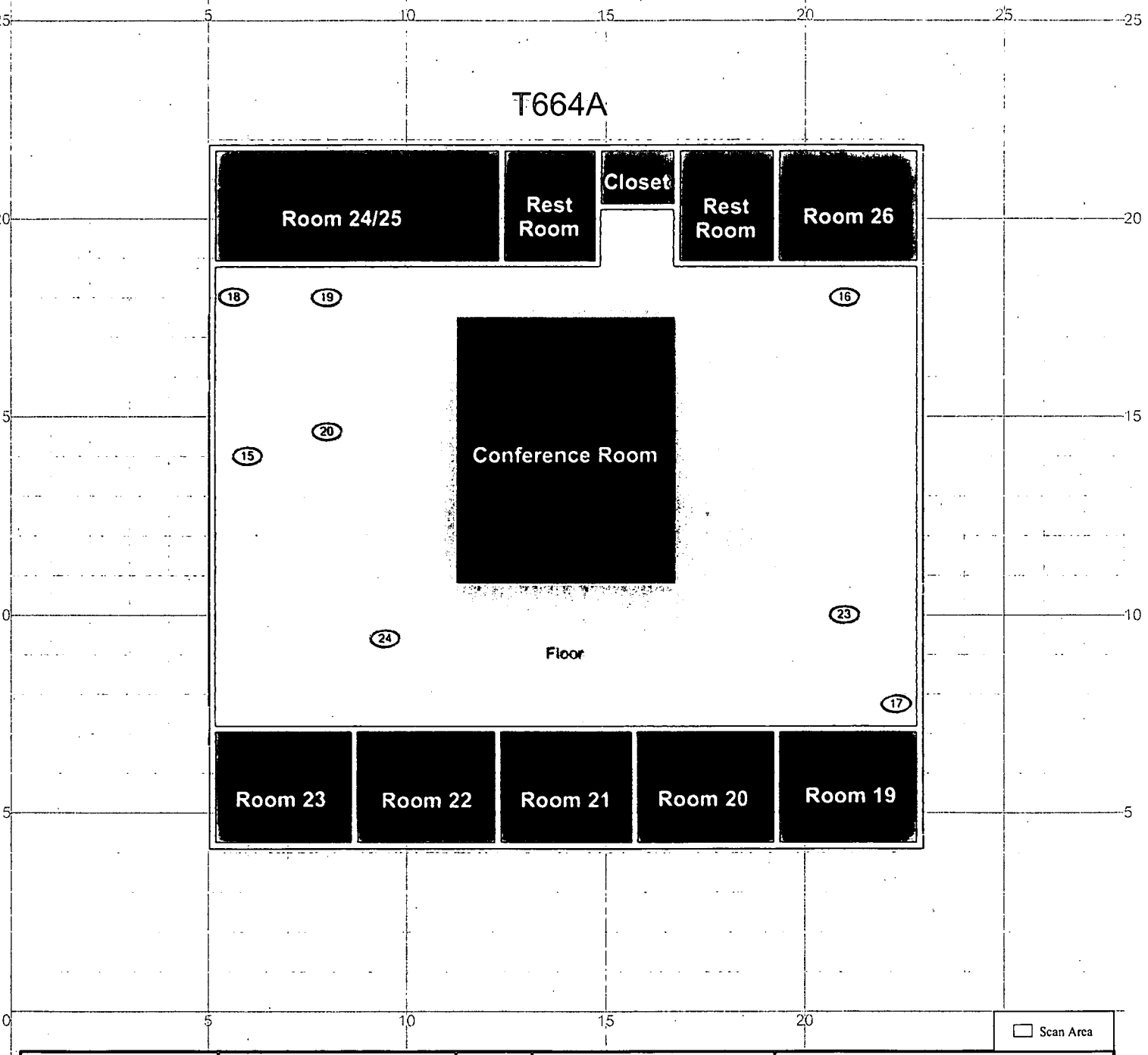
CH2MHILL Communications Group

KAISER-HILL COMPANY

MAP ID: 03-0138\T664A-FP **February 21, 2003**

PRE-DEMOLITION SURVEY FOR T664A

Survey Area: 5 Survey Unit: 664A06 Classification: 3
Building: T664A
Survey Unit Description: Building T664A Interior (All surfaces)
Total Area: 968 sq. m. Total Floor Area: 298 sq. m.



Scan Area

SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 15
0 METERS 5

1 inch = 12 feet 1 grid sq. = 1 sq. m.

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):
1, 2 & 3

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Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707 Prepared for:

CH2MHILL Communications Group

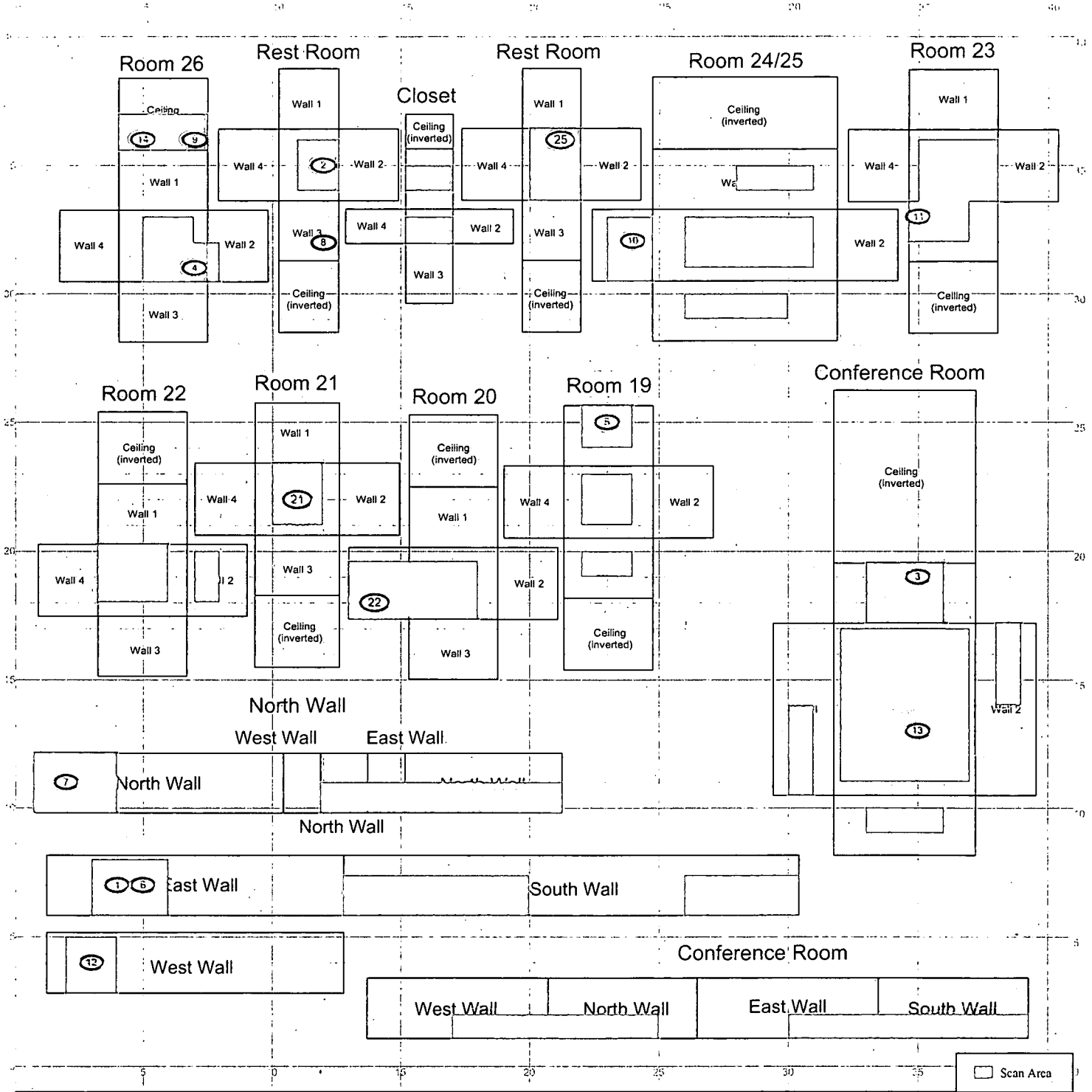
KAISER-HILL COMPANY

MAP ID: 03-0138\T664A-IN1_SC Oct 19, 2004

57

PRE-DEMOLITION SURVEY FOR T664A

Survey Area: 5 **Survey Unit: 664A06** **Classification: 3**
Building: T664A
Survey Unit Description: Building T664A Interior (All surfaces)
Total Area: 968 sq. m. **Total Floor Area: 298 sq. m.**



SURVEY MAP LEGEND

- Smear & TSA Location
- Smear, TSA & Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 25
0 METERS 8

1 inch = 18 feet 1 grid sq. = 1 sq. m.

Scan Survey Information
Survey Instrument ID #(s) & RCT ID #(s):
1, 2 & 3

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KAISER-HILL COMPANY

MAP ID: 03-0138\T664A-IN2_SC **Oct 19, 2004**

ATTACHMENT D

Chemical Data Summaries and Sample Maps

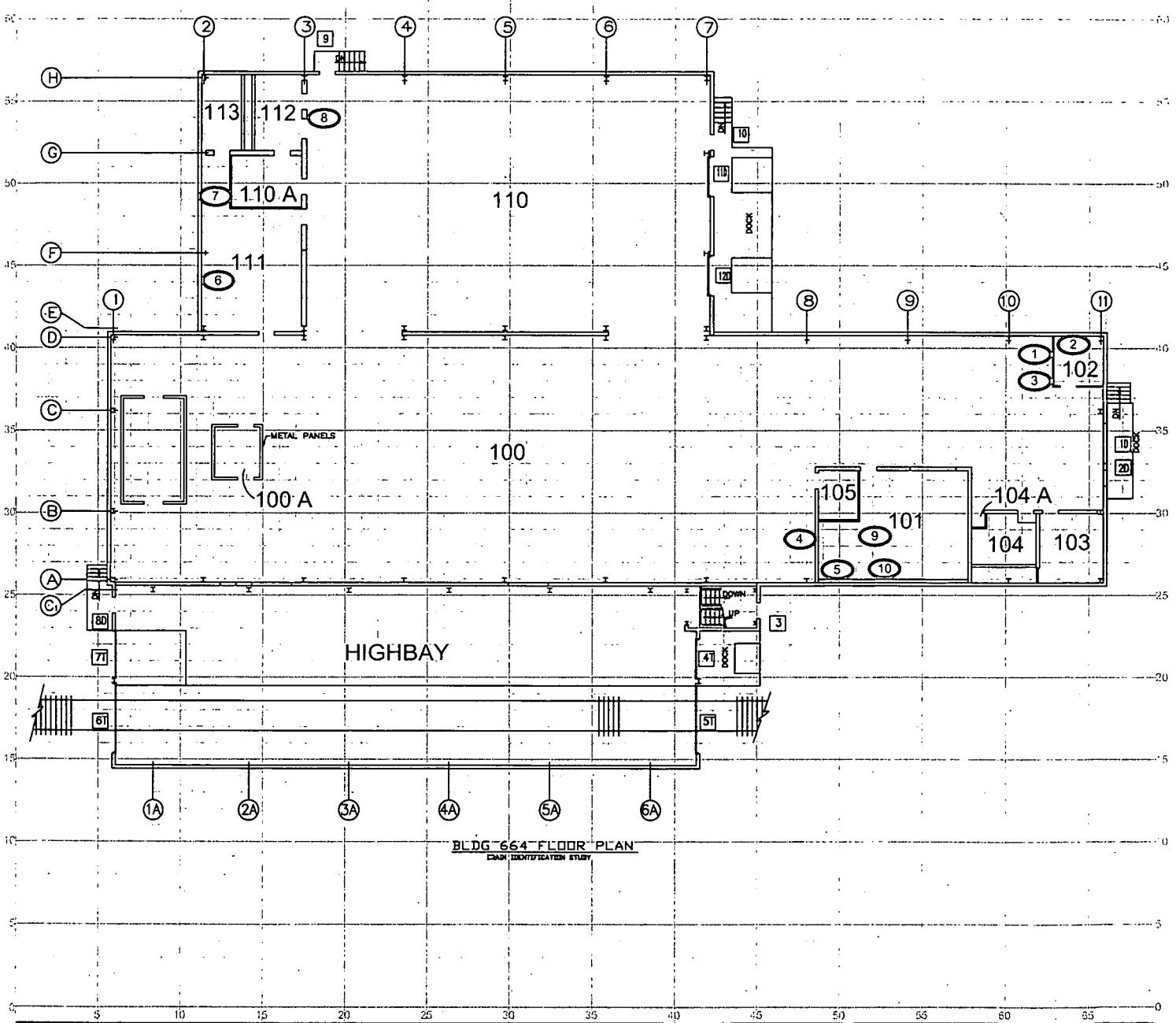
Asbestos Data Summary

Sample Number	Sample Point Map Location	Room	Material Sampled and Location	Analytical Results
Building 664 – RIN 04Z2309				
664-08042004-314-001	1	102	White TSI elbow	None Detect
664-08042004-314-002	2	102	Drywall & joint compound	None Detect
664-08042004-314-003	3	102	Drywall & joint compound	None Detect
664-08042004-314-004	4	101	Drywall & joint compound	None Detect
664-08042004-314-005	5	101	Heater elbow	None Detect
664-08042004-314-006	6	111	Drywall & joint compound	None Detect
664-08042004-314-007	7	111	Hot water heater elbow	None Detect
664-08042004-314-008	8	112	Skimcoat	None Detect
664-08042004-314-009	9	Mezz	Small elbow	None Detect
664-08042004-314-010	10	101	Skimcoat	None Detect
T664A - RIN 03Z1921				
T664A-06262003-315-201	1	Ceiling Tile	White/tan ceiling tile	None Detect
T664A-06262003-315-202	2	Floor Tile	Tan mastic/White floor tile	None Detect

60

CHEMICAL SAMPLE MAP

Building 664
Asbestos



BLDG 664 FLOOR PLAN
CHAIN IDENTIFICATION STUDY

SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 40

0 METERS 10

1 inch = 30 feet 1 grid sq. = 1 sq. m.

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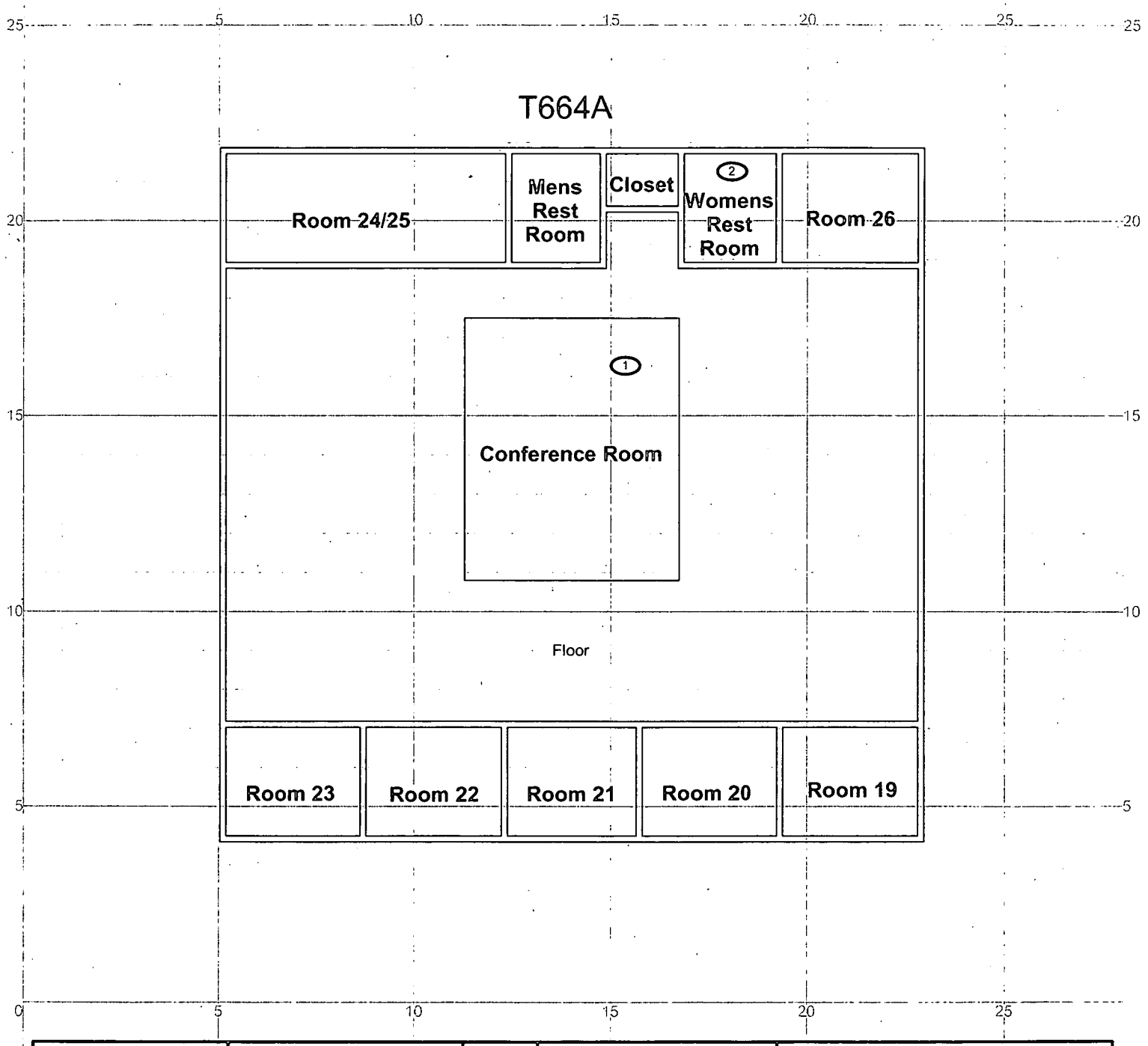
MAP ID: 03-0305/664-KP_ASB

Oct 18, 2004

61

CHEMICAL SAMPLE MAP

Building T664A
Asbestos



SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 15
0 METERS 5

1 inch = 12 feet 1 grid sq. = 1 sq. m.

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Prepared for: KAISER-HILL COMPANY

MAP ID: 03-0138\T664A-IN1-ASB Oct 22, 2003

62

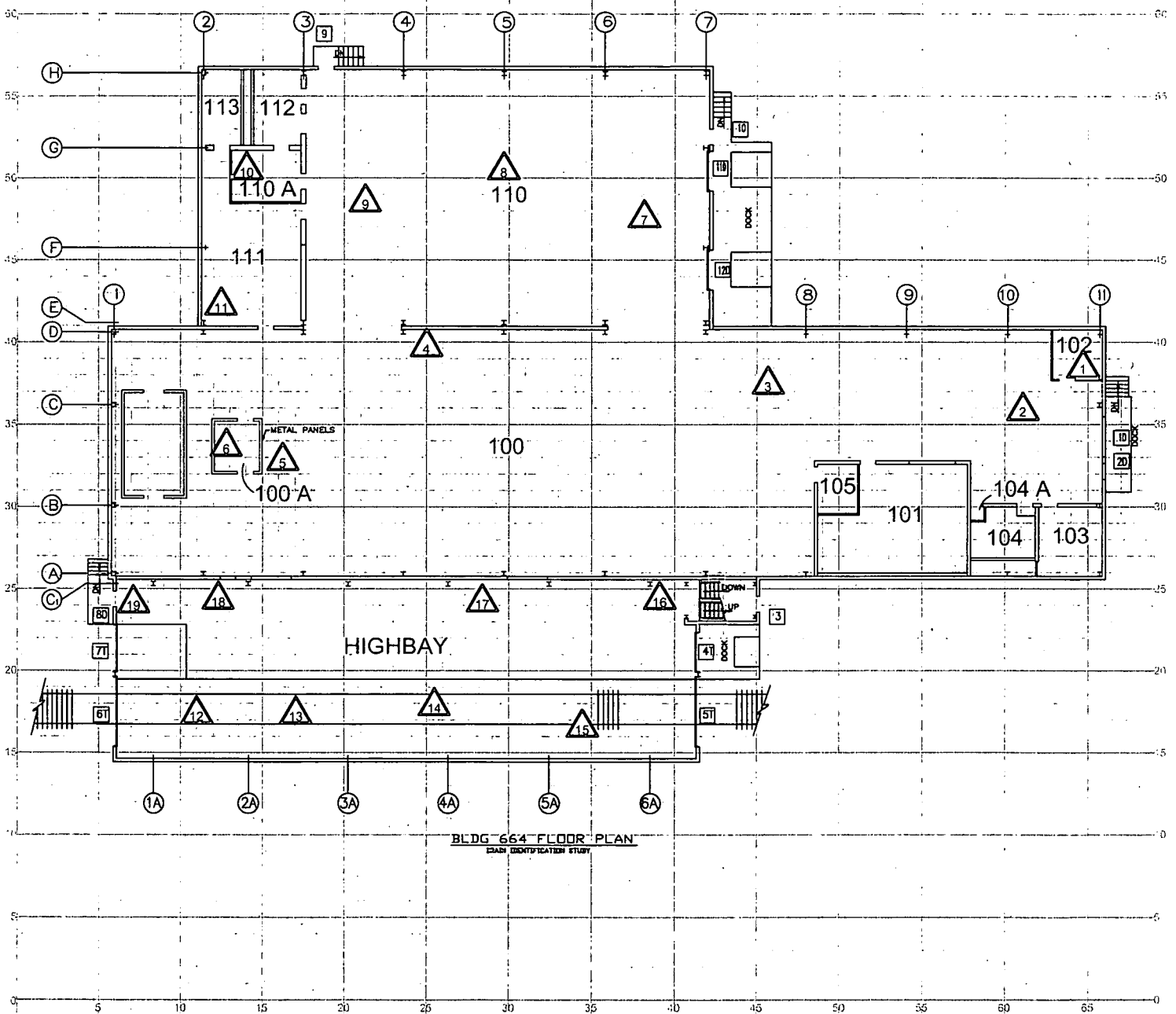
Beryllium Data Summary

Sample Number	Sample Point Map Location	Room	Sample Location	Sample Result (ug/100cm^2)
Building 664 – RIN 05D0094 (Biased)				
664-10142004-00-001	1	102	Top of sprinkler riser	<0.1
664-10142004-00-002	2	100	Floor	<0.1
664-10142004-00-003	3	100	Floor	<0.1
664-10142004-00-004	4	100	Top of wall beam	<0.1
664-10142004-00-005	5	100	Floor	<0.1
664-10142004-00-006	6	100A	Top of control panel	<0.1
664-10142004-00-007	7	110	Floor	<0.1
664-10142004-00-008	8	110	Floor	<0.1
664-10142004-00-008	9	110	Floor	<0.1
664-10142004-00-010	10	110A	Top of cabinet	<0.1
664-10142004-00-011	11	111	Floor	<0.1
664-10142004-00-012	12	100	Floor	<0.1
664-10142004-00-013	13	100	Floor	<0.1
664-10142004-00-014	14	High Bay	Top of deck	<0.1
664-10142004-00-015	15	High Bay	Top of tray	<0.1
664-10142004-00-016	16	High Bay	Top of I-beam	<0.1
664-10142004-00-017	17	High Bay	Top of railing	<0.1
664-10142004-00-018	18	High Bay	On insulation	<0.1
664-10142004-00-019	19	High Bay	Top of railing	<0.1
Building T664A – RIN 05D0095 (Biased)				
664TA-10142004-00-006	1	24/25	Top of cabinet shelf	<0.1
664TA-10142004-00-007	2	Mens Restroom	On counter top	<0.1
664TA-10142004-00-008	3	Womens Restroom	On counter top	<0.1
664TA-10142004-00-008	4	26	Top of cabinet	<0.1
664TA-10142004-00-010	5	19	On desk	<0.1
664TA-10142004-00-011	6	20	On table	<0.1
664TA-10142004-00-012	7	21	On cabinet	<0.1
664TA-10142004-00-013	8	22	On window sill	<0.1
664TA-10142004-00-014	9	23	Top of cabinet shelf	<0.1
664TA-10142004-00-015	10	CR	Top of locker	<0.1

63

CHEMICAL SAMPLE MAP

Building 664
Beryllium



BLDG 664 FLOOR PLAN

SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 40

0 METERS 10

1 inch = 30 feet 1 grid sq. = 1 sq. m.

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

CH2MHILL Communications Group

Prepared for: KAISER-HILL COMPANY

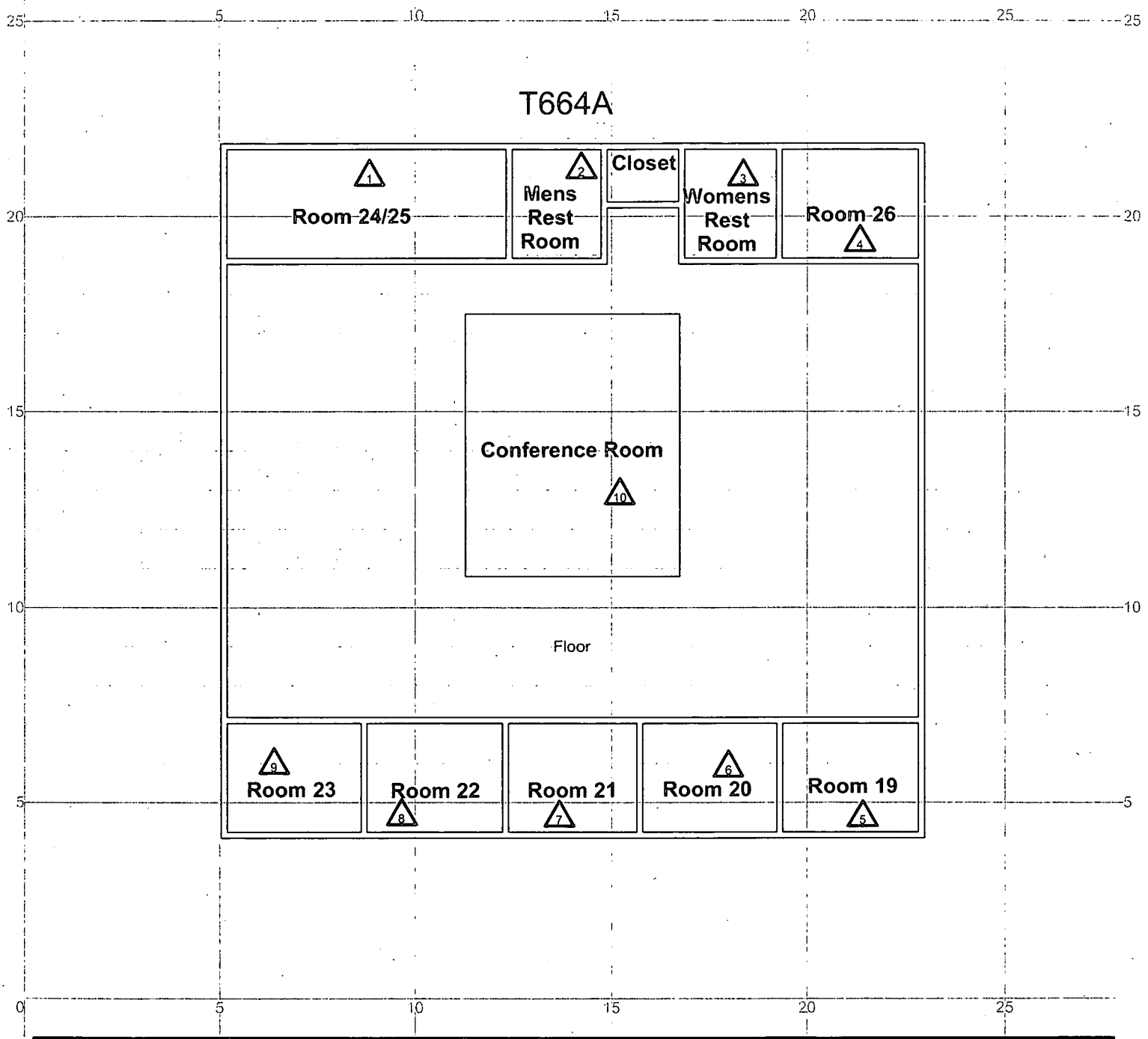
MAP ID: 03-0305/664-KP

March 18, 2003

64

CHEMICAL SAMPLE MAP

Building T664A
Beryllium



SURVEY MAP LEGEND

- Asbestos Sample Location
- Beryllium Sample Location
- Lead Sample Location
- RCRA/CERCLA Sample Location
- PCB Sample Location
- Open/Inaccessible Area
- Area in Another Survey Unit

N

0 FEET 15

0 METERS 5

1 inch = 12 feet 1 grid sq. = 1 sq. m.

U.S. Department of Energy
Rocky Flats Environmental Technology Site

Prepared by: GIS Dept. 303-966-7707

CH2MHILL
Communications Group

Prepared for: KAISER-HILL COMPANY

MAP ID: 03-0138\T664A-IN1-BE Oct 22, 2003

ATTACHMENT E

Data Quality Assessment (DQA) Detail

DATA QUALITY ASSESSMENT (DQA)

VERIFICATION & VALIDATION OF RESULTS

V&V of the data confirm that appropriate quality controls are implemented throughout the sampling and analysis process, and that any substandard controls result in qualification or rejection of the data in question. The required quality controls and their implementation are summarized in a tabular, checklist format for each category of data – radiological surveys and chemical analyses (specifically asbestos and beryllium).

DQA criteria and results are provided in a tabular format for each suite of surveys or chemical analyses performed; the radiological survey assessment is provided in Table E-1, asbestos in table E-2 and beryllium in E-3. A data completeness summary for all results is given in Table E-4.

All relevant Quality records supporting this report are maintained in the RISS Characterization Project Files. This report will be submitted to the CERCLA Administrative Record for permanent storage within 30 days of approval by the Regulators. All radiological data are organized into Survey Packages, which correlate to unique (MARSSIM) Survey Units. Chemical data are organized by RIN (Report Identification Number) and are traceable to the sample number and corresponding sample location.

Beta/gamma survey designs were not implemented for Buildings 664 and T664A based on the conservatism of the transuranic limits used as DCGLs in the unrestricted release decision process. Survey designs were implemented based on the transuranic limits used as DCGLs in the unrestricted release decision process. All survey results were evaluated against, and were less than the Transuranic $DCGL_w$ (100 dpm/100cm^2) and the Uranium $DCGL_w$ (5,000 dpm/100cm^2) unrestricted release limits.

Consistent with EPA's G-4 DQO process, the radiological survey design (for those survey units performed per PDS requirements) was optimized by checking actual measurement results (acquired during pre-demolition surveys) against model output with original estimates. Use of actual sample/survey (result) variances in the MARSSIM DQO model confirms that an adequate number of surveys were acquired.

SUMMARY

In summary, the data presented in this report have been verified and validated relative to the quality requirements and project decisions as stated in the original DQOs. All data are useable based on qualifications stated herein and are considered satisfactory without qualification. All media surveyed and sampled yielded results less than their associated action levels and with acceptable certainties, except for the following anomalous conditions:

- The remaining composite roofing material (roof flashing and tar) is assumed to be Category 1 non-friable asbestos, and will be managed and disposed of as sanitary waste during demolition activities.

67

Based upon an independent review of the radiological data, it was determined that the original project DQOs satisfied MARSSIM guidance. All facility contamination levels were below applicable unrestricted release levels. Minimum survey requirements were met, sampling/survey protocol was performed in accordance with applicable procedures, survey units were properly designed and bounded, and instrument performance and calibration were within acceptable limits thereby ensuring accuracy criteria. All results meet the PDS unrestricted release criteria.

Chain of Custody was intact; documentation was complete, hold times were acceptable (where applicable,) and packaging integrity/custody seals were maintained throughout the sampling/analysis process. Level 2 Isolation Controls have been posted to prevent the inadvertent introduction of contamination into the facilities. On this basis, Buildings 664 and T664A meets the unrestricted release criteria with the confidences stated herein and can be demolished.

Table E-1 V&V of Radiological Surveys – Buildings 664 and T664A

V&V CRITERIA, RADIOLGICAL SURVEYS		K-H RSP 16.00 Series MARSSIM (NUREG-1575)		
QUALITY REQUIREMENTS				
Parameters		Measure	frequency	COMMENTS
ACCURACY	initial calibrations	90%<x<110%	≥1	Multi-point calibration through the measurement range encountered in the field; programmatic records.
	daily source checks	80%<x<120%	≥1/day	Performed daily/within range.
	local area background: Field	typically < 10 dpm	≥1/day	All local area backgrounds were within expected ranges (i.e., no elevated anomalies.)
PRECISION	field duplicate measurements for TSA	≥ 5% of real survey points	≥10% of reals	N/A
REPRESENTATIVENESS	MARSSIM methodology: Survey Units 664501 (Bldg. 664 interior), 664A06 (Bldg. T664A interior) and EXT-B-001 (exterior).	statistical and biased	NA	Random w/ statistical confidence.
	Survey Maps	NA	NA	Random and biased measurement locations controlled/mapped to ±1m.
	Controlling Documents (Characterization Pkg; RSPs)	qualitative	NA	Refer to the Characterization Package (planning document) for field/sampling procedures (located in Project files); thorough documentation of the planning, sampling/analysis process, and data reduction into formats.
COMPARABILITY	units of measure	dpm/100cm^2	NA	Use of standardized engineering units in the reporting of measurement results.
COMPLETENESS	Plan vs. Actual surveys usable results vs. unusable	>95% >95%	NA	See Table E-4 for details.
SENSITIVITY	detection limits	TSA: ≤50 dpm/100cm^2 RA: ≤10 dpm/100cm^2	all measures	MDAs ≤ 50% DCGL$_w$ per MARSSIM guidelines (RLC performed to PDS criteria).

Table E-2 V&V of Asbestos Results – Buildings 664 and T664A

V&V CRITERIA, CHEMICAL ANALYSES		DATA PACKAGE		
ASBESTOS	METHOD: EPA 600/R-93/116	LAB ---->	Reservoirs Environmental, Inc	
QUALITY REQUIREMENT		RIN ---->	RIN04Z2309 (664) RIN03Z1921 (T664A)	
		Measure	Frequency	COMMENTS
ACCURACY	Calibrations: Initial/continuing	below detectable amounts	≥1	Semi-quantitative, per (microscopic) visual estimation.
PRECISION	Actual Number Sampled LCSD Lab duplicates	all below detectable amounts	≥ 12 samples	Semi-quantitative, per (microscopic) visual estimation.
REPRESENTATIVENESS	COC	Qualitative	NA	Chain-of-Custody intact: completed paperwork, containers w/ custody seals.
	Hold times/preservation	Qualitative	NA	N/A
	Controlling Documents (Plans, Procedures, maps, etc.)	Qualitative	NA	See original Chemical Characterization Package (planning document); for field/sampling procedures (located in project file;) thorough documentation of the planning, sampling/analysis process, and data reduction into formats.
COMPARABILITY	Measurement Units	% by bulk volume	NA	Use of standardized engineering units in the reporting of measurement results.
COMPLETENESS	Plan vs. Actual samples Usable results vs. unusable	Qualitative	NA	See Table E-4; final number of samples at Certified Inspector's discretion.
SENSITIVITY	Detection limits	<1% by volume	all measures	N/A

Table E-3 V&V of Beryllium Results – Buildings 664 and T664A

V&V CRITERIA, CHEMICAL ANALYSES		DATA PACKAGE		
BERYLLIUM	Prep: NMAM 7300 METHOD: OSHA ID-125G	LAB ---->	Johns Manville Corp. Littleton, Co.	
QUALITY REQUIREMENTS		RIN ---->	RIN05D0094 (B664) RIN05D0095 (T664A)	
		Measure	Frequency	COMMENTS
ACCURACY	Calibrations Initial	Linear calibration	≥1	No qualifications significant enough to change project decisions i.e., classification of a Type 1 facilities is confirmed. All results were below associated action levels.
	Continuing	80%<%R<120 %	≥1	
	LCS/MS	80%<%R<120 %	≥1	
	Blanks - lab & field	<MDL	≥1	
	interference check std (ICP)	NA	NA	
PRECISION	LCSD	80%<%R<120 % (RPD<20%)	≥1	
	field duplicate	all results < RL	≥1	
REPRESENTATIVENESS	COC	Qualitative	NA	
	hold times/preservation	Qualitative	NA	
	Controlling Documents (Plans, Procedures, maps, etc.)	Qualitative	NA	
COMPARABILITY	measurement units	ug/100cm^2	NA	
COMPLETENESS	Plan vs. Actual samples usable results vs. unusable	>95% >95%	NA	
SENSITIVITY	detection limits	MDL of 0.00084 ug/100cm^2	all measures	

Table E-4 Data Completeness Summary – Buildings 664 and T664A

ANALYTE	Building/Area/Unit	Sample Number Planned (Real & QC)	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
Asbestos	Building 664 (interior)	12 samples (interior)	10 biased (interior)	No ACM present, all results are < 1% by volume	40 CFR763.86; 5 CCR 1001-10; EPA 600/R-93/116 RIN04Z2309 (map locations 1 through 10) The remaining composite roofing material (roof flashing and tar) is assumed to be Category 1 non-friable asbestos and will be removed during demolition activities and disposed of as sanitary waste.
Asbestos	Building T664A (interior)	3 samples (interior)	2 biased (interior)	No ACM present, all results are < 1% by volume	40 CFR763.86; 5 CCR 1001-10; EPA 600/R-93/116 RIN03Z1921 (map locations 1 and 2)
Beryllium	Building 664 (interior)	10 biased (interior)	19 biased (interior)	No beryllium contamination found, all results less than associated action levels	OSHA ID-125G RIN05D0094 No results above action level (0.2ug/100cm^2) or investigative level (0.1 ug/100cm^2).
Beryllium	Building T664A (interior)	5 biased (interior)	10 biased (interior)	No beryllium contamination found, all results less than associated action levels	OSHA ID-125G RIN05D0095 No results above action level (0.2ug/100cm^2) or investigative level (0.1 ug/100cm^2).

Table E-4 Data Completeness Summary – Buildings 664 and T664A

ANALYTE	Building/Area/Unit	Sample Number Planned (Real & QC)	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
Radiological	Survey Area 5 Survey Unit 664501 Building 664 (interior)	59 α TSA (29 systematic/30 biased) & 59 α Smears (29 systematic/30 biased) 29 α TSA and 29 α Smears (equipment) 2 QC TSA 25% scan of floors and 5% scan of remaining interior surfaces	58 α TSA (29 systematic/29 biased) & 58 α Smears (29 systematic/29 biased) 30 α TSA and 29 α Smears (equipment) 2 QC TSA 25% scan of floors and 5% scan of remaining interior surfaces	No contamination found, all results are below the PDS unrestricted release levels	Transuranic DCGLs were used.
Radiological	Survey Area 5 Survey Unit T664A6 Building T664A (interior)	20 α TSA (15 random/5 biased) & 20 α Smears (15 random/5 biased) 5 α TSA and 5 α Smears (equipment) 2 QC TSA 5% scan of interior surfaces	20 α TSA (15 random/5 biased) & 20 α Smears (15 random/5 biased) 5 α TSA and 5 α Smears (equipment) 2 QC TSA 5% scan of interior surfaces	No contamination found, all results are below the PDS unrestricted release levels	Transuranic DCGLs were used.